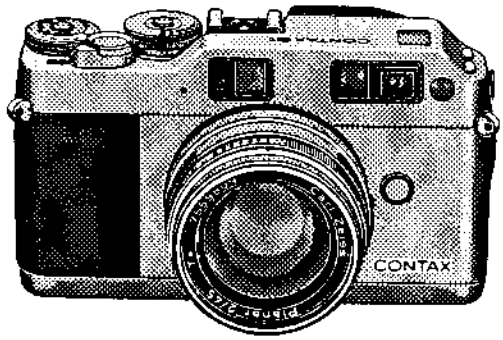
KYOCERA

NO.	419-01-50-RA1AQ01

CONTAX G1

Repair Manual



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A. GENERAL & TECHNICAL INFORMATION

FEATURES

The CONTAX G1 is a 35mm AF rangefinder camera with focal plane shutter. It maintains not only the CONTAX concept of "camera reflecting photographer's vision and creativity" but also employs a new concept aiming at another ease of photography.
This compact camera with an interchangeable lens and automatic focusing (AF) function is a new system camera that displays the high performance of SLR cameras and the excellent portability of compact cameras.

「AF」
- ●An AF rangefinder and an external passive AF system with an extended base length (distance between the two focusing windows).
- ●The camera emits an AF-assist beam automatically when the subject is under low light or low contrast situations.

「AE」
- ●Center-weighted average light metering performed by TTL actual exposure metering system that measures the light reflected by the shutter curtain.
  (Automatic switching to external metering when the Hologon lens is mounted)
- ●A Silicon Photo Diode (SPD) is located in the upper central area of the camera body.

「Viewfinder」
- ●Real-image viewfinder whose magnification varies with the angle of view of the mounted lens.
- ●Parallax correction is automatically and steplessly adjusted by the mechanism employing a dedicated motor.
- ●Built-in diopter adjuster permits diopter adjustments in a range from +0.3D to −2D.

「Viewfinder Display」
- ●Large LCD viewfinder indicators
  Information necessary for photography, such as shutter speed, exposure warning, flash ready mark, exposure compensation and AF scale, are arranged in a way easy to see.

「Drive Mode」
- ●Drive modes for single-frame exposure, continuous shooting, self-timer (10 seconds) and multiple exposure.

「Shutter」
- ●Electrically controlled vertical travel focal-plane shutter with speeds up to 1/2000 second.
- ●The double-structure shutter unit has a gray shutter curtain on the mount side that ensures correct TTL actual exposure metering, and a shutter curtain for light shielding on the film side.

「Custom Function」
* Custom function permits the photographer to change settings as desired.
- ●Selection of AE lock operation.
- ●Selection of A.B.C. exposure order.
- ●Selection of leaving the film leader outside the film cartridge after rewinding.

「Body Cover」
- ●Titanium is used for the body covering, which is ideal to meet all the requirements of light weight, high strength, and shock and corrosion resistance as well as beautiful finish.

「Camera Body」
- ●Precisely processed copper/silumin die-cast alloy chassis is employed.

「TLA Flash System」
- ●Any of the TLA series flash units of the CONTAX SLR flash system can be used as an auto flash controlled by TTL direct flash metering.
- ● The TLA280,TLA360 and TLA480 flash units can be used even with second curtain synchronization.

「Dedicated Interchangeable Lens」
- ●For use in the CONTAX G1 system, Carl Zeiss has developed four new lenses, namely, Hologon 16mm F 8, Biogon 28mm F2.8, Planar 45mm F2 and Sonnar 90mm F2.8.
- ●The lens mount is a newly developed CONTAX G mount of Spigot bayonet type.

CONTAX G1 Specifications

Type	: 35mm AF rangefinder camera with focal plane shutter.
Image Size	: 24×36mm
Lens Mount	: CONTAX G mount.
Shutter	: Electronically-controlled vertical-travel focal-plane shutter.
Shutter Speed	: 16secs. to 1/2000 sec. at "Aperture-priority auto exposure", Manual mode... 1 sec. to 1/2000 sec. B and X (1/100 sec.).
Synchronization Contact	: Direct X contact (synchronizing speeds 1/100 sec. or slower), provided with synchronization terminal.
Self-timer	: Electronic self-timer with a 10 sec. delay, cancelable halfway.
Shutter Release	: Electromagnetic release, provided with an exclusive release socket.
Exposure Control	: ①Aperture-priority auto exposure ②Manual exposure ③TTL auto flash ④Manual flash.
Metering System	: TTL actual exposure metering (center-weighted average light metering) / External metering (automatic switchover with the mounted lens).
Metering Range	: EV1～19 on TTL actual exposure metering (ISO 100,F2), EV3～17 on external metering (ISO 100).
Film Speed Range	: ISO 25～5000 for automatic setting with DX film, ISO 6～6400 for manual setting.
AE Lock	: The shutter speed is stored in the memory.
Exposure Compensation	: +2 EV ～ −2 EV (can be set in 1/3-EV increments).
A.B.C. Mode	: ±0.5 EV/±1 EV exposure compensating values with A.B.C. lever.
Flash Light Control	: TTL direct light control.
Flash Synchronization	: In combination with dedicated flash, the shutter speed is automatically set when the flash is fully charged.
Second Curtain Synchronization	: Possible with CONTAX flash having a second curtain synchronization capability.
Focusing	: Automatic focusing with focusing dial, switchable to manual focusing.
Distance Measurement	: Extended base length type external passive AF method, provided with AF-assist beam and focus lock.
Focus Sensing Range(ISO 100)	: EV3～EV19. The distance is indicated in the viewfinder and on display panel.
Viewfinder	: Real-image viewfinder (coupling with the mounted lens), 0.57 × magnification and 90% field of view (with 45mm lens, at infinity and −1D diopter).
Diopter Adjustment	: Built-in diopter adjuster, adjusting range +0.3D～−2D.
Display in Viewfinder	: Picture area frame (automatic parallax adjustment), focusing frame, focus display, shutter speed, exposure mark, exposure compensation, flash mark.
Display Panel	: Shooting distance/film speed, drive mode (single-frame exposure, continuous shooting, self-timer, multiple exposure), custom function mark and battery warning mark.
Film Loading	: Auto loading, automatic film positioning to "01" on counter.
Film Advance	: Automatic winding with built-in motor.
Film Rewinding	: Automatic rewinding with built-in motor, automatic stop/return after rewinding is completed, mid-roll rewinding possible.
Drive Mode	: Single-frame exposure, continuous shooting, self-timer, multiple exposure.
Winding Speed	: Up to about 2 frames/sec. on continuous shooting ("C"mode) (with new batteries, at ordinary temperature, as tested according to CONTAX testing standard).
Exposure Counter	: Automatic-resetting additive type, A.B.C.display.
Accessory Shoe	: Direct X-contact hot shoe (provided with TLA flash contact).
Custom Function	: ①AE lock operation (AE lock is activated by pressing shutter release button halfway or turning main switch to AEL position.

②A.B.C. exposure order selection (standard→over→under/over→standard→under).
③Film end rewinding (completely rewound/film end left wound)

Camera Back : Can be opened by camera back opening knob, detachable, provided with film check window.
Power Source : Two 3V lithium batteries(CR2).
Battery Check : Automatic check, battery warning mark in display panel.
Dimensions : 133(W)×77(H)×42(D)mm (5-1/4×3-1/16×1-11/16in.)
Weight : 460g (16.23ozs.) (without batteries)

Specifications of the CONTAX G1 DATA BACK GD-1(Optional)

Type : Built-in quartz clock with liquid crystal display.
Position of imprint : Lower right corner.
Details of Imprint : ①Year/month/day ②Day/hour/minute ③No imprint ④Month/day/year ⑤Day/month/year(automatic date correction).
Imprinting : automatically coupled with the shutter activation (with the imprint check indication).
Film Speed Setting : Automatic.
Power Source : One 3V lithium battery (CR2025).
Dimensions : 132.5(W) × 54(H) × 17.5(D)mm (5-1/4 × 2-1/8 × 11/16 in.)
Weight : 80g (2.83oz.) (w/o battery)

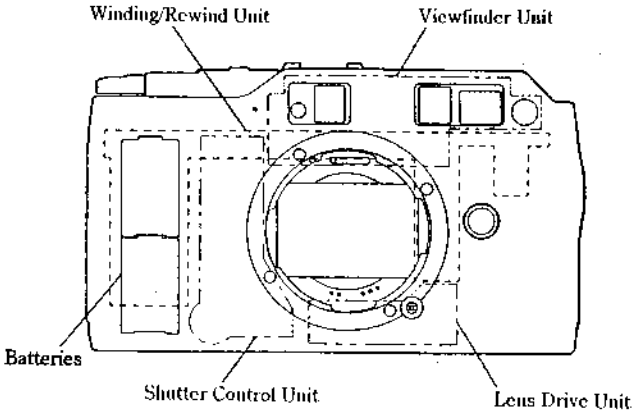
*Design and specifications are subject to change without notice.

DESCRIPTION OF MECHANISMS

1. Internal Structure

This camera consists of eight major blocks — the camera body, body mount, finder mechanism, shutter control mechanism, lens drive mechanism, film transport mechanism, electronic circuitry and exterior.
The lens mount is the newly developed CONTAX G mount. The power source is lithium batteries (CR2) of new specifications, which is located inside the spool to reduce the size of the camera.
This camera with an interchangeable lens employs a focal plane shutter.
In the upper area, the camera incorporates a unit consisting of the variable real-image viewfinder coupled with taking lenses and the passive AF module with an elongated base length. The film transport unit is located below the viewfinder and the lens drive unit is in the lower area of the camera. Thus the space inside the camera is utilized efficiently while ensuring the high performance of the camera (Fig. 1).

(Layout of Units)

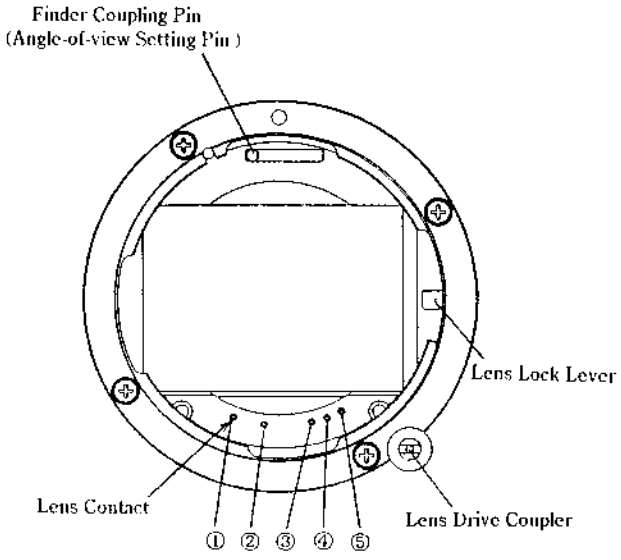


(Fig. 1)

(1) CONTAX G Mount

The CONTAX G1 employs the newly developed CONTAX G mount of Spigot bayonet type. The Lens Drive Coupler is positioned out of the mount surface to reduce the diameter of the mount. Inside the mount on the body side, the Angle-of-view Setting Pin, Lens Signal Pin and Lens Lock Lever are provided for the communication with the body (Fig. 2).
The Spigot bayonet mount improves the positioning accuracy between the Lens Drive Coupler and the Lens Signal Pin; its structure is highly reliable. For easy lens replacement, all the exterior parts except the root of the Lens Barrel and the Aperture Ring rotate together with the bayonet claw.
By the operation of the Finder Coupling Pin on the lens-side mount, the Angle-of-view Setting Pin moves to a position corresponding to the focal length of the lens. This pin operates the variable viewfinder so that the viewfinder is adjusted to the angle of view of the interchangeable lens.
The Lens Signal Pin communicates the type of the lens, the reference signal for the lens extension and the compensation value for each lens.

(CONTAX G Mount)



① GND
② Power Supply (VDD)
③ Lens Identification Terminal
④ Infinity Position Adjusting Terminal
⑤ Detection of Start Position Code Terminal

(Fig. 2)

(2) Viewfinder Mechanism

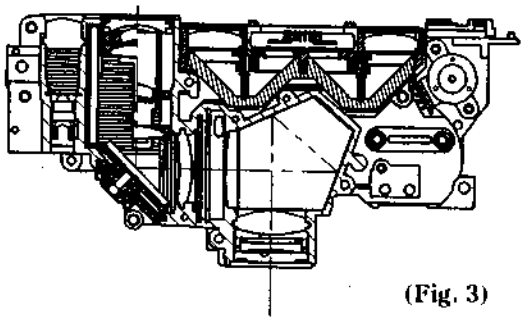
The viewfinder is a real-image zoom type whose magnification automatically changes according to the interchangeable lenses except Hologon lens (16 mm). It covers focal length ranging from 28 to 90 mm. With a lens mounted, the Finder Coupling Pin on the lens moves the Angle-of-view Setting Pin of the Body to change the angle of view. The optical system consists of three objective lenses, an aluminum-evaporated glass mirror, two condenser lenses near the focusing plane and two lenses for the Eyepiece (Fig. 3). Since the variable optical system uses aspherical glass mold lenses, the total length is reduced in spite of the highly variable magnification. The Eyepiece consists of two lenses constituting achromatic lens and diopter adjustments are achieved by changing the distance between them.

The framing of the viewfinder is performed accurately even at close-up shooting. Therefore, parallax correction is performed by moving the correction frame according to the shooting distance for each taking lens. The correction frame, located behind the field-of-view frame in the focusing plane, corrects the field of view by changing the positions of the upper and left sides of the frame.

To drive the parallax correction mechanism, the ultra-small pulse motor rotates the cam gear. The cam moves the Parallax Correction Lever, which operates the Parallax Correction Mechanism in the Viewfinder (Fig. 4). Thanks to the ultra-small pulse motor, parallax correction can be performed steplessly only in a small space.

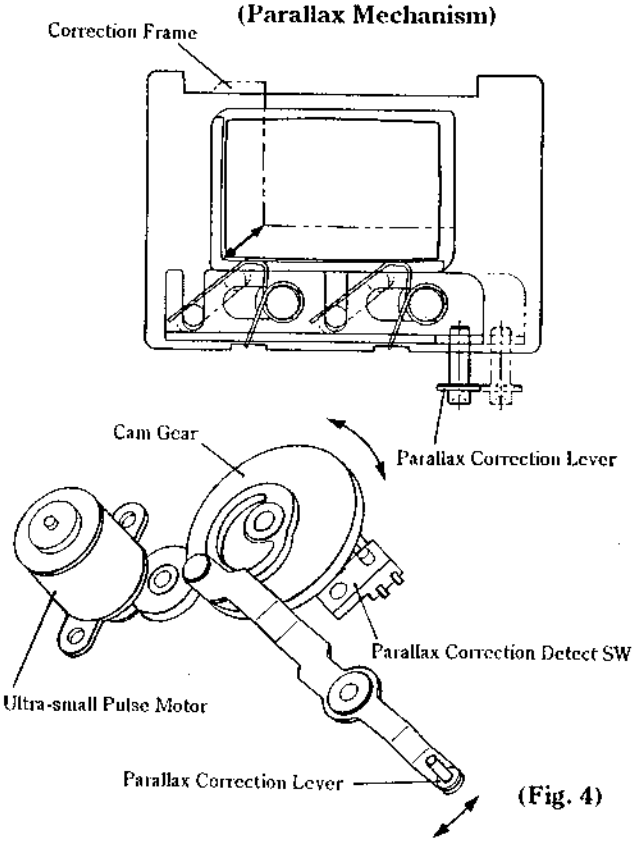
In addition to the parallax correction frame, the viewfinder displays the focus target frame in the picture area frame. Under the picture area frame, the viewfinder displays camera information, such as exposure compensation, flash ready mark, focus indicator, shutter speed and exposure warning (Fig. 10).

(Cross Section of Viewfinder)



(Fig. 3)

(Parallax Mechanism)



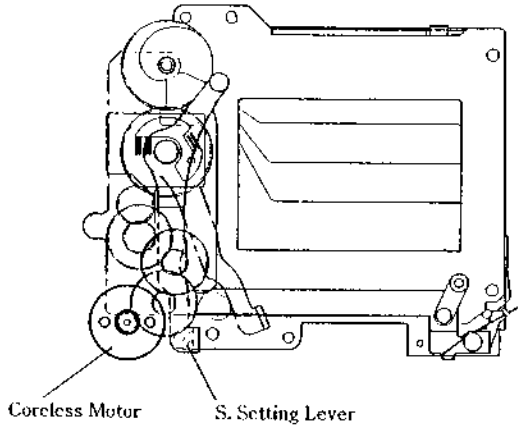
(Fig. 4)

(3) Shutter Control Mechanism

The CONTAX G1 employs a newly developed electrically controlled focal plane shutter. The shutter speeds in automatic mode are from 16 seconds to 1/2000 second. In manual mode, the shutter allows Bulb exposures and operates correctly at shutter speeds of X (1/100 second) and from 1 second to 1/2000 seconds.

The CONTAX G1 does not have the quick return mirror as is provided in SLR cameras. In the CONTAX G1, therefore, the light leakage from the shutter to film plane is perfectly prevented by a light-proof curtain on the film plane side of the Shutter. The Shutter Unit, incorporating the light-proof curtain, is compact and reliable.

(Shutter Control Mechanism)



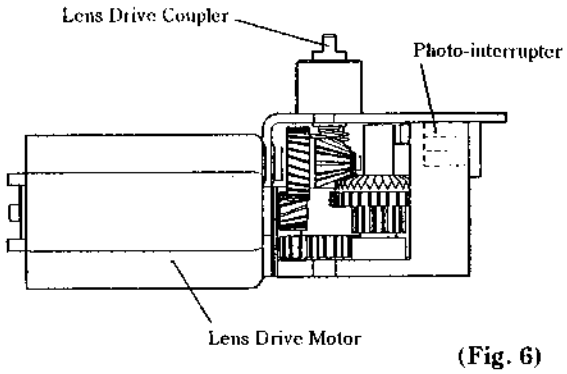
(Fig. 5)

The camera performs direct light metering via a TTL actual exposure metering system that measures the light reflected by the shutter curtain. For this purpose, the first curtain of the shutter is coated gray to reflect the light uniformly.
The shutter charge mechanism is driven by a small coreless motor that displays excellent start and stop characteristics. The rotation of the rotor of the motor is transferred through a gear train to the cam that operates the S. Setting Lever to charge the shutter. At press of the Shutter Release Button, the motor runs to retract the S. Setting Lever and open the light-proof curtain of the shutter. Subsequently, the first and second curtains having been held by the Shutter Magnet travel so that the film is exposed. The drive system is small, since the gears are arranged efficiently and the switches for controlling operation timing are located in the middle of the gear train (Fig. 5).

(4) Lens Drive Mechanism

The lens drive mechanism consists of a DC motor as the drive source, reduction gears, an encoder and coupler that constitute a unit. A two-phase output photo-interrupter is used to control the lens positioning. One revolution of the coupler is divided into 290 for drive control (Fig. 6).
Thanks to the two-phase output photo-interrupter, the camera judges correctly the direction of drive even under unstable conditions, such as acceleration or deceleration. The feedback to the drive signal ensures a highly reliable control.

(Lens Drive Mechanism)

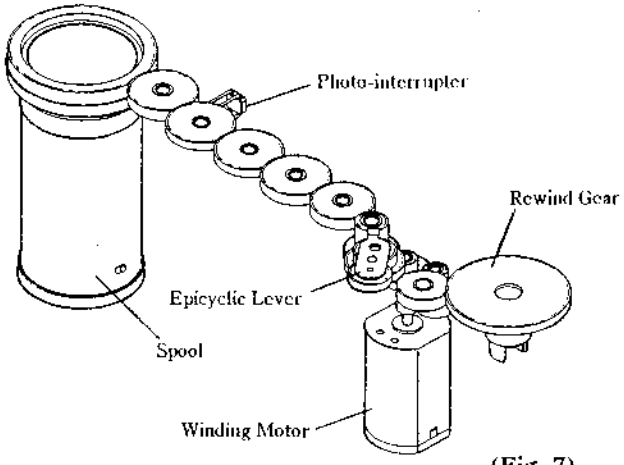


(Fig. 6)

(5) Film Transport Mechanism

The film transport and rewinding mechanisms, constituting a unit, are located under the Viewfinder. In the forward or reverse run of the motor, the position of the Epicyclic Lever is switched and film winding is performed by the Spool and rewinding by the Cartridge Fork (Fig. 7).
To control film travel, the movement of the perforations is directly detected with a reflection type photo-interrupter. Thus this compact mechanism ensures a highly reliable film advance.

(Film Transport Unit)

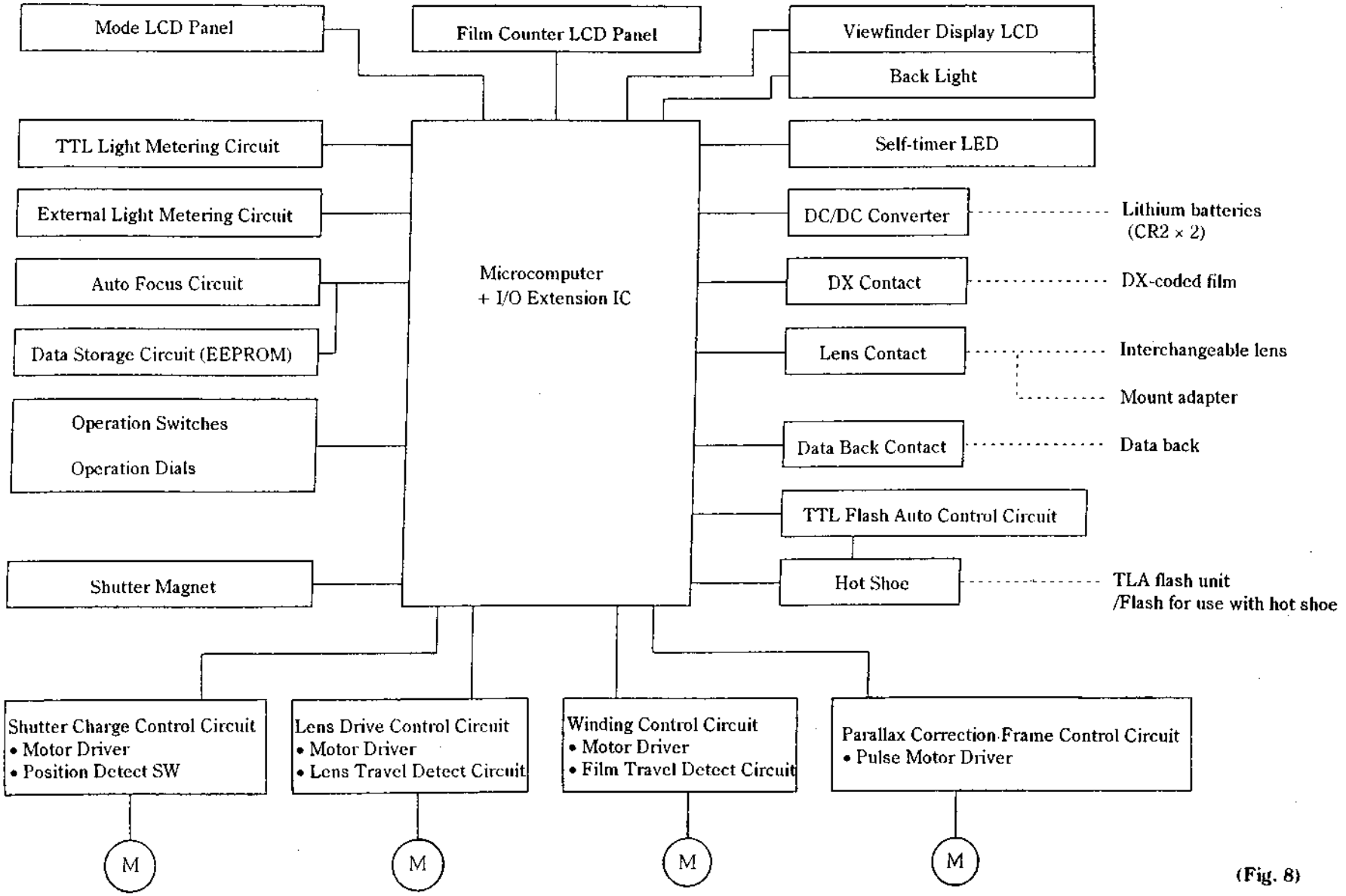


(Fig. 7)

2. Electronic Circuitry and Its Arrangement

The Circuit Block Diagram shows the constitution of the electronic circuitry (Fig. 8). All the circuits are connected to the 8-bit microcomputer as the core.
The light metering circuit consists of two systems, namely, the TTL light metering circuit and the external light metering circuit, which use dedicated light metering ICs, respectively.
The TTL Light Metering IC is located on the top of the Black Box and the External Light Metering IC is at the side of the Light Metering Module.
The TTL Flash Auto Control Circuit is located on the Black Box. It detects the light reflected by the film surface during exposure (TTL actual exposure direct light metering) and controls flash intensity (TTL Flash Auto control).
For information display, there are two external LCDs and one LCD in the Viewfinder, which are controlled directly by the microcomputer.
In this way, the circuits are packaged all over the camera. However, port extension ICs are arranged properly to reduce the quantity of wiring.

CIRCUIT BLOCK DIAGRAM



(Fig. 8)

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3. Display

(1) External Display

For external display, in addition to the dials, there are two LCDs, namely, the Film Counter and the Display Panel.

The Exposure Counter LCD, dedicated to displaying data on the film, displays the exposure count after each winding and counts down during rewinding. Also by blinking the display, the Exposure Counter provides loading error warning (shutter locked) and A.B.C. display. The Exposure Counter LCD is located separately from other displays for easy reading.

The Display Panel LCD displays drive mode, film speed/shooting distance and battery warning mark (Fig. 9). This LCD is located at the side of the Drive Mode Selector Button and Film Speed Button to facilitate their setting.

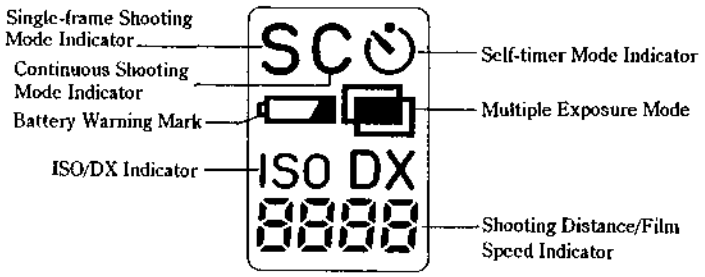
The numerical display by a 4-digit number indicates selectively the film speed or the shooting distance. It shows the distance usually, but is switched by the Film Speed Button to display the film speed.

In auto focus mode, the display is switched by a half-way depression of the Shutter Release Button to show the distance measurement result. It also displays the distance measurement result during use of the Hologon lens in manual focusing or use of the Mount Adapter GA-1 to facilitate the distance setting of the lens.

In manual focusing, the display shows the distance setting of the Focus Dial so that the photographer can read such a precise distance as is difficult to read from the dial indicator.

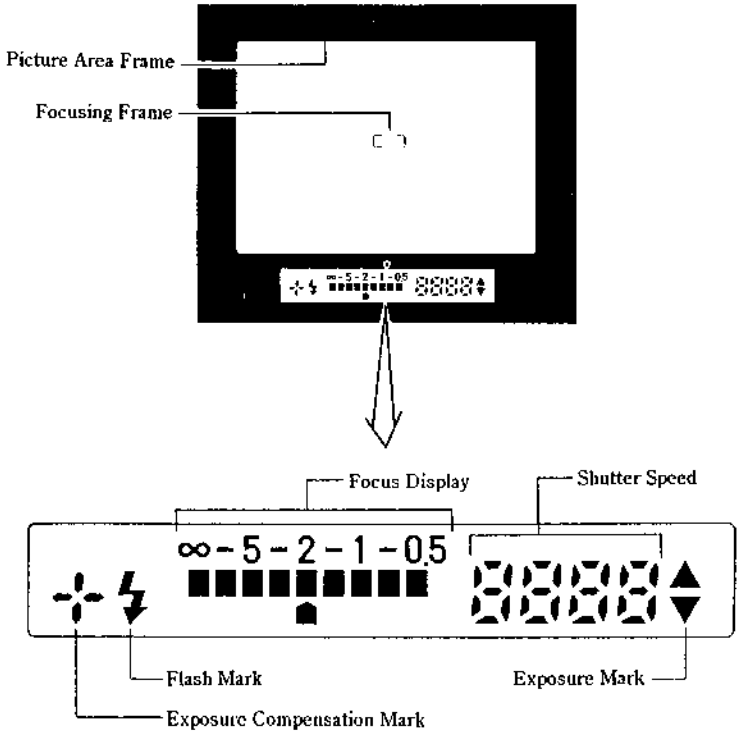
(Exposure Counter Display)

(Display Panel)



(Fig. 9)

(Viewfinder Display)



(Fig. 10)

(2) Viewfinder Display

The viewfinder display consists of indicators on an LCD Panel and back light by an LED.

The LCD in the viewfinder indicates only the information necessary at shooting, that is, shutter speed, exposure mark, focus display, exposure compensation mark and TLA flash ready mark (Fig. 10).

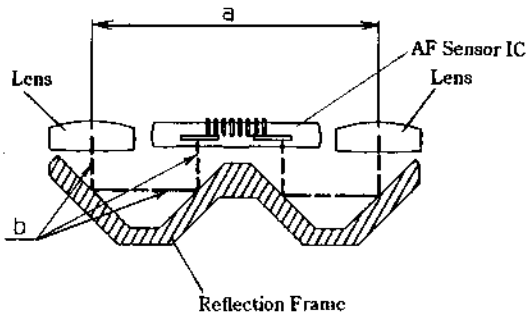
The focus display is switched between the display in Auto Focus mode and that in Manual Focus mode for easy use in each mode.

In Auto Focus mode, the focus display shows a distance scale ranging from the nearest point to the infinity and a dot indicating the distance measurement result for easy recognition of an unintended focusing. The nearest point in the distance scale is switched between 0.5 m and 1.0 m depending on the mounted lens.
In Manual Focus mode, the focus display indicates the variance from the true focus point by a bar length. It indicates a dot at the center when the subject is in true focus; the larger the variance, the longer the bar. Thanks to this bar indication, the photographer can easily see the required amount of the dial operation in manual focusing.

4. Auto Focus

The CONTAX G1 employs an external passive AF system. The high accuracy of distance measurement and the improved lens drive control by the motor in the camera body ensure a high focusing accuracy with various interchangeable lenses.
When the subject is under low light or low contrast situations, the camera emits the AF-assist beam automatically to enable an accurate distance measurement.

(AF Optical System)



(Fig. 11)

(1) AF Optical System

To ensure a high AF accuracy, left and right two-surface mirrors are installed and the base length between the focusing lenses is maximized (Fig. 11). Thanks to the W-shape of the mirrors, the AF optical system is located properly between the Viewfinder Unit and the Body.
The distance measurement capability is generally proportional to the base length "a" multiplied by the focusing distance "b" (Fig. 11). In the CONTAX G1, the base length is 28.4 mm and the focusing distance 21 mm. That is, $a \times b = 596.4$, which is about 6.2 times as large as the capability of the CONTAX T VS.

(2) AF Sensor

Because of the phase difference detection by the external passive AF system, the image size on the sensor does not change when the focal length of the taking lens is changed. Accordingly, at use of a lens with a long focal length, it is necessary to narrow the data area to be used for the calculation of distance measurement. The AF Sensor IC uses 356 line sensor elements to provide an adequate resolution even in the narrow data area. That is, 178 photosensor elements are arranged in each of two rows on the AF Sensor IC. The sensor output is converted to a digital value and processed in the IC and then sent to the microcomputer by serial communication.

(3) Calculation and Control

The CONTAX G1 selects a calculation data area according to not only the focal length of the taking lens, as mentioned above, but also according to the camera-to-subject distance.
In the external passive AF system, parallax can occur according to the camera-to-subject distance. To correct the vertical parallax, the camera changes the position of the focus target, relative to the screen, by the correction frame in the viewfinder. It corrects the horizontal parallax by changing the data area for calculation. With the Main Switch turned ON, the camera keeps performing distance measurement. The distance measurement in this state uses the data area corresponding to some representative distances between the infinity and the nearest point. The camera determines the distance to the main subject by comparing the calculation results. In this way, auto focusing is correctly achieved by selecting a calculation area for the focal length of the mounted lens and the camera-to-subject distance.
Lens drive control is correctly performed by changing the speed reduction timing according to the mounted lens.

5. Exposure Control

(1) Exposure Control

The light metering circuit consists of the two systems for TTL light metering and external light metering.

The TTL light metering is an actual exposure direct light metering in which the light reflected by the first curtain of the shutter is measured through the dedicated lens (Fig. 12). This system employing the actual exposure light metering is simple and highly reliable, since it does not use any interlocking levers.

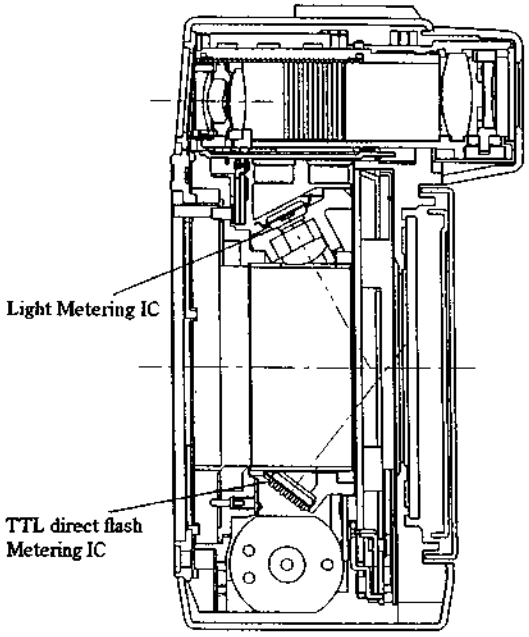
The external light metering is performed by the Light Metering ICs located at the side of the focusing windows.

With the Hologon lens mounted, the distance from the end of the rear element to the shutter curtains is too short to allow an accurate metering of the light reflected by the first curtain. In such a case, the external light metering is selected.

This selection is automatically performed according to the lens information output from the circuit inside the lens.

Also when a lens permitting the TTL light metering has been mounted, the camera keeps performing external light metering. Then it changes the brightness of the display back light in the viewfinder according to the light metering results.

(Body Central Part Cut-away View)



(Fig. 12)

(2) Exposure Compensation

Automatic exposure is selected when the Shutter Speed Dial is set to AUTO. In this state, the Shutter Speed Dial functions as the Exposure Compensation Dial.

Exposure compensation can be set in the range of ± 2 EV in 1/3 EV increments. The dial is mechanically confined within the compensation limit positions not to move unintentionally to a manual exposure position. No lock mechanism is provided at the zero compensation position so that the photographer can easily set the dial without removing the eye from the viewfinder.

When an exposure compensation has been set, the LCD in the viewfinder displays "+" or "–" to indicate the exposure compensation status. This display is also intended to warn the photographer against his or her forgetting to release the compensation setting after the shooting.

In addition to the compensation by the Exposure Compensation Dial, the A.B.C. function (three-frame continuous automatic exposure compensation) is available. With the A.B.C. setting, three frames can be exposed under automatic compensation; standard exposure → overexposure → underexposure. The order of compensations can be changed by the custom function to "overexposure → standard exposure → underexposure". The A.B.C. function can be used in combination with the Exposure Compensation Dial to set various types of three frame continuous automatic exposure compensation, for example, "standard exposure → underexposure → underexposure".

Exposure bracketing can be set in ± 0.5 EV or ± 1.0 EV increments by the A.B.C. Lever located under the Shutter Speed Dial (Exposure Compensation Dial).

(3) TTL Flash Auto Control

TTL direct flash control is possible with a TLA Flash Unit. This control system measures the light reflected from the film plane during exposure and stops flashing upon detection of an optimum exposure.

Exposure compensation can be set in 1/3 steps by the Exposure Compensation Dial.

This TTL direct flash control is possible not only with the TLA140, which was put on the market at the same time as the CONTAX G1, but also with other CONTAX TLA Flash Units. The TLA 280, TLA 360 and TLA 480 allow the TTL direct flash control even with second curtain synchronization.

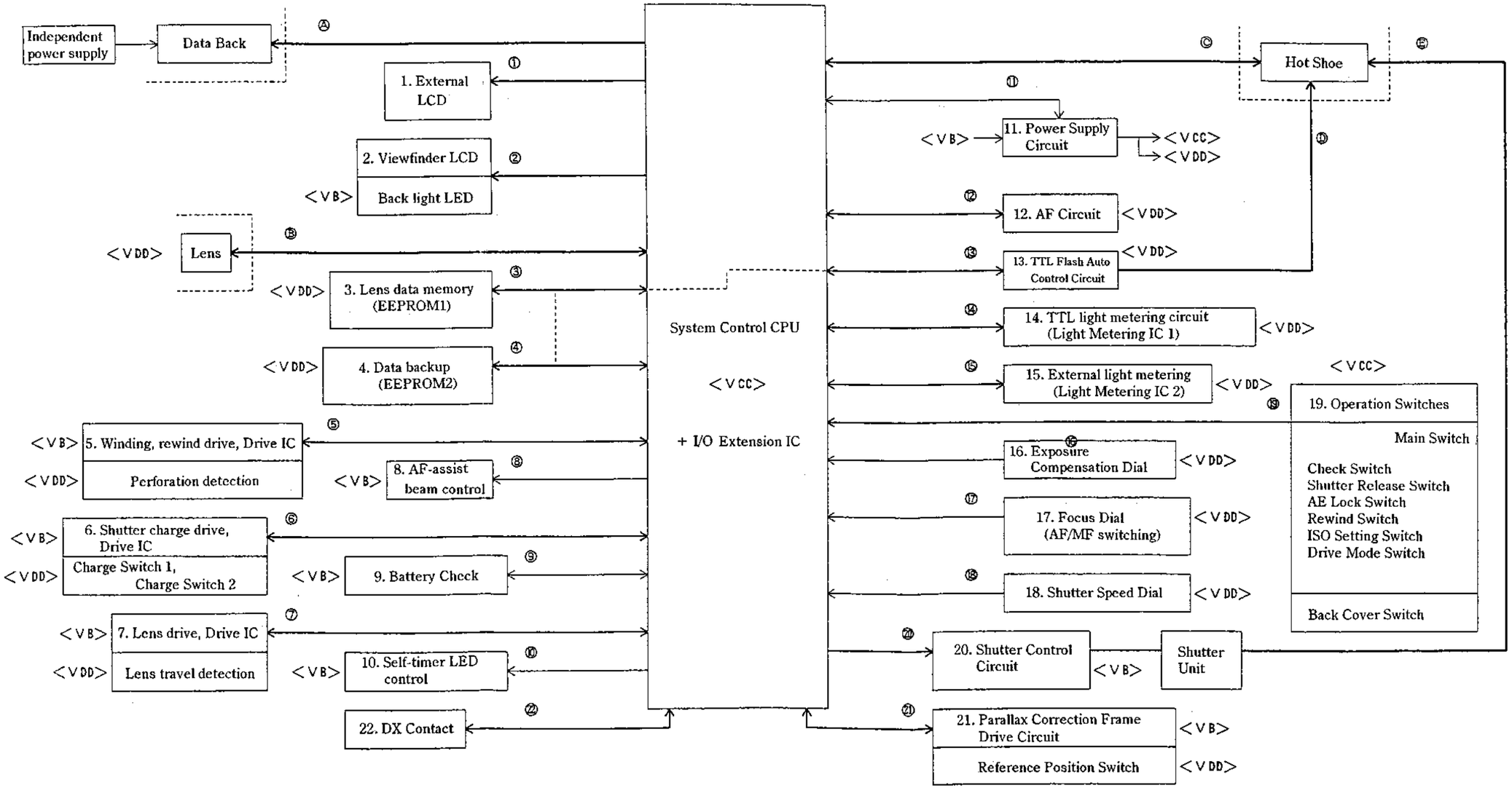
With the CONTAX G1, the photographer can use the extension cord and other accessories for an additional flash designed for use with the SLR camera system. With them, the user can perform the same flash shooting as with an SLR camera.

BLOCK CIRCUIT DIAGRAM

: Single signal line

: Multiple signal line (described on pages 13 to 16 with the numbers in O)

: Signal lines for communication with external accessories (described on page 16 with the alphabetic characters in O)



DESCRIPTION OF BLOCK CIRCUITS

* Description of Functions and Signal Lines of Circuits in each Block

1. External Display

Two reflection type LCDs are used. The External LCD1 displays the film speed, shooting distance and drive mode. It consists of 36 segments. The External LCD2 displays the exposure counter, consisting of 11 segments. The LCD driver in the CPU controls these displays by the 3-time-division system.

2. Viewfinder Display and Back Light LED

The transmission type LCD displays the exposure compensation status, flash status, AF indicator, distance measurement result, manual focus indicator, shutter speed and exposure warning. It consists of 49 segments. The circuit is divided into three and controlled by the 3-time-division system of the LCD driver.
The Back Light LED holds lighting during power-ON. Its brightness changes in three steps according to the light metering result. This LED is controlled through one control line and driven by a transistor.

①②. LCDs (viewfinder and external) : SEG (32 pcs.) × COM (3 pcs.)
LED control : Back Light LED lighting

3. Lens Data Memory (EEPROM1)

This IC stores the characteristic data of the interchangeable lenses that were put on the market at the same time as the CONTAX G1.
This memory is independent of the Data Backup so that the EEPROM carrying the characteristic data of the lenses can be replaced when a new lens has been put on the market.

③. Serial communication line : SCK, D1, D0 (shared with EEPROM2. SCK and D0 are shared with TTL Flash Auto Control IC.)
CPU → EEPROM1 : CS1

4. Data Backup (EEPROM2)

This IC stores adjusted values and camera status in EEPROM.

④. Serial communication line : SCK, D1, D0 (shared with EEPROM1. SCK and D0 are shared with TTL Flash Auto Control IC.)
CPU → EEPROM2 : CS2

5. Winding/Rewind Drive and Perforation Detection

The winding and rewind mechanism is driven by one micro motor. Winding is performed by the forward run of the motor while rewinding by the reverse run. The brake function ensures each correct film advance by one frame (8 perforations). Perforation detection is performed by a reflection type photo-interrupter.

⑤. (Winding drive motor control)	CPU → Winding motor driver : Control signal × 2
(Perforation detection)	CPU → Photo-interrupter : LED lighting signal
	Photo-interrupter → CPU : Perforation pulse

6. Shutter Charge Drive and Charge Switch

The motor runs forward and rotates the cam in one direction. In this operation, the cam moves the Shutter Charge Lever, which performs shutter charge, and retracts the Shutter Charge Lever immediately before the shutter operation.
The Charge Switch 1 in combination with the Charge Switch 2 detects the completion of the Shutter Charge Lever retracting and the completion of shutter charge. The brake function stops the cam correctly at completion of shutter charge.

⑥. (Cam drive motor control) CPU → Cam drive motor driver : Control signal × 2
(Charge Lever position detection) Charge Switch 1 : Hi, Charge Switch 2 : Low → Charge Lever retracting
Charge Switch 1 : Low, Charge Switch 2 : Low → Completion of Shutter Charge

7. Lens Drive and Lens Travel Detection

The motor in forward run moves the lens in the direction of "nearest end → infinity end", while the motor in reverse run moves the lens in the direction of "infinity end → nearest end".
The brake function stops the lens in a proper position.
The lens travel is detected by a photo-interrupter.

⑦. (AF drive motor control) CPU → AF drive motor driver : Control signal ×2
(Lens travel detection) CPU → AF photo-interrupter : LED lighting signal
AF photo-interrupter → CPU : AF pulse

8. AF-assist Beam Control Circuit

This circuit drives the AF-assist beam emitter when auto focusing is impossible. This circuit operates at a constant current of 200 mA.

⑧. CPU → AF-assist beam : LED lighting signal

9. Battery Check

The battery voltage is divided by resistance and a relative battery voltage is read in to the CPU.
The transistor is turned ON and OFF so that no current flows through the resistors in the power-OFF state.

⑨. Battery check circuit → CPU : Battery monitor voltage
CPU → Battery check circuit : PH control signal

10. Self-timer LED Control Circuit

This circuit keeps LED blinking during the operation of the self-timer (10 seconds).

⑩. CPU → Self-timer LED : LED lighting signal

11. Power Supply Circuit

For the power to the circuits, there are three power supplies, namely, VB, VCC and VDD. The battery voltage is 6.4V maximum.
VB is the battery voltage, which is applied to the circuits requiring a large power.
VDD outputs a constant voltage according to the control signal from the CPU.
VDD outputs 5.0 ± 0.5 V by receiving an input of 2.5 to 6.5 V.
VCC, as the power supply for operation in the power-OFF state, outputs a constant voltage irrespective of the control signal from the CPU.
VCC outputs 5.0 ± 0.2 V by receiving an input of 5.4 to 6.5 V.

⑪. CPU → DC/DC Converter : PH control signal

12. AF Circuit

Under control of the CPU, the AF circuit outputs AF data from the output terminal (serial communication).

⑫. (AF-IC control) AF-IC → CPU : DATA, END
CPU → AF-IC : EXT-END, RESET, AD, ROR/AND, READ-CLK, CS (6 data in total)

13. TTL Flash Auto Control Circuit

This circuit integrates the light reflected from the surface of film and stops flash upon detection of an optimum light exposure while the shutter is open. The inputs to this IC are the integration start signal and ISO data (serial communication) while the output is the flash firing stop signal.

⑬. (TTL Flash Auto Control IC control) CPU → TTL Flash Auto Control IC : CS3, SD1, SCK, CHC
TTL Flash Auto Control IC → CPU : CHS → CH I/O → CPU

14. TTL Light Metering Circuit (Light Metering IC1)

The light metering distribution is based on the center-weighted average metering and the light metering range is EV 1 to 19 (a lens of f 45mm, F2.0).
The light metering system measures the light reflected from the surface of shutter curtain. The light metering output and temperature output are A/D converted and read in to the CPU.

⑭. Light Metering IC → CPU : TO, PO (A/D converted and read in)

15. External Light Metering (Light Metering IC2)

Light metering is performed outside only when the Hologon lens is used. (With the Hologon lens mounted, the camera can not perform TTL light metering.) This circuit is similar to the TTL Light Metering Circuit.

⑮. Light Metering IC2 → CPU : PO (A/D converted and read in) Light Metering IC1 is used for TO.

16. Exposure Compensation Dial

This dial is a turning type with a compensation range of ± 2 EV. It allows 13-step compensation in increments of 1/3 step.
The input through a sliding resistor is A/D converted and read in to the CPU. Three lines of VDD, GND and A/D signal are connected to the sliding resistor.

⑯. Exposure Compensation Dial → CPU : A/D converted (one line)

17. Focus Dial

This dial is a turning type allowing AF/MF switching. The sliding resistor position is A/D converted and read in to the CPU. Three lines of VDD, GND and A/D signal are connected to the sliding resistor.

⑰. Focus Dial → CPU : A/D converted (one line)

18. Shutter Speed Dial

This dial is a turning type that allows setting to AV, B, X and the 17-step shutter speeds from 1 second to 1/2000 second in 1 TV increments.
The input through a sliding resistor is A/D converted and read in to the CPU. Three lines of VDD, GND and A/D signal are connected to the sliding resistor.

⑱. Shutter Speed Dial → CPU : A/D converted (one line)

19. Operation Switches

The signals from external operation switches are input to the CPU. The operation of an operation switch brings the camera into the power-ON state.

⑲. Operation Switch → CPU : 9 lines (see the Diagram on page A-12)

20. Shutter Control Circuit

This circuit controls the holding of the two magnets for the first curtain and second curtain.

⑳. CPU → Control of shutter magnets : First curtain control signal and second curtain control signal

21. Parallax Correction Frame Drive Circuit

This circuit drives the motor for correcting the parallax at close-up shooting.

㉑. CPU → Pulse motor driver : Control signal × 4
Reference position switch → CPU : Reference position detection

22. DX Contact

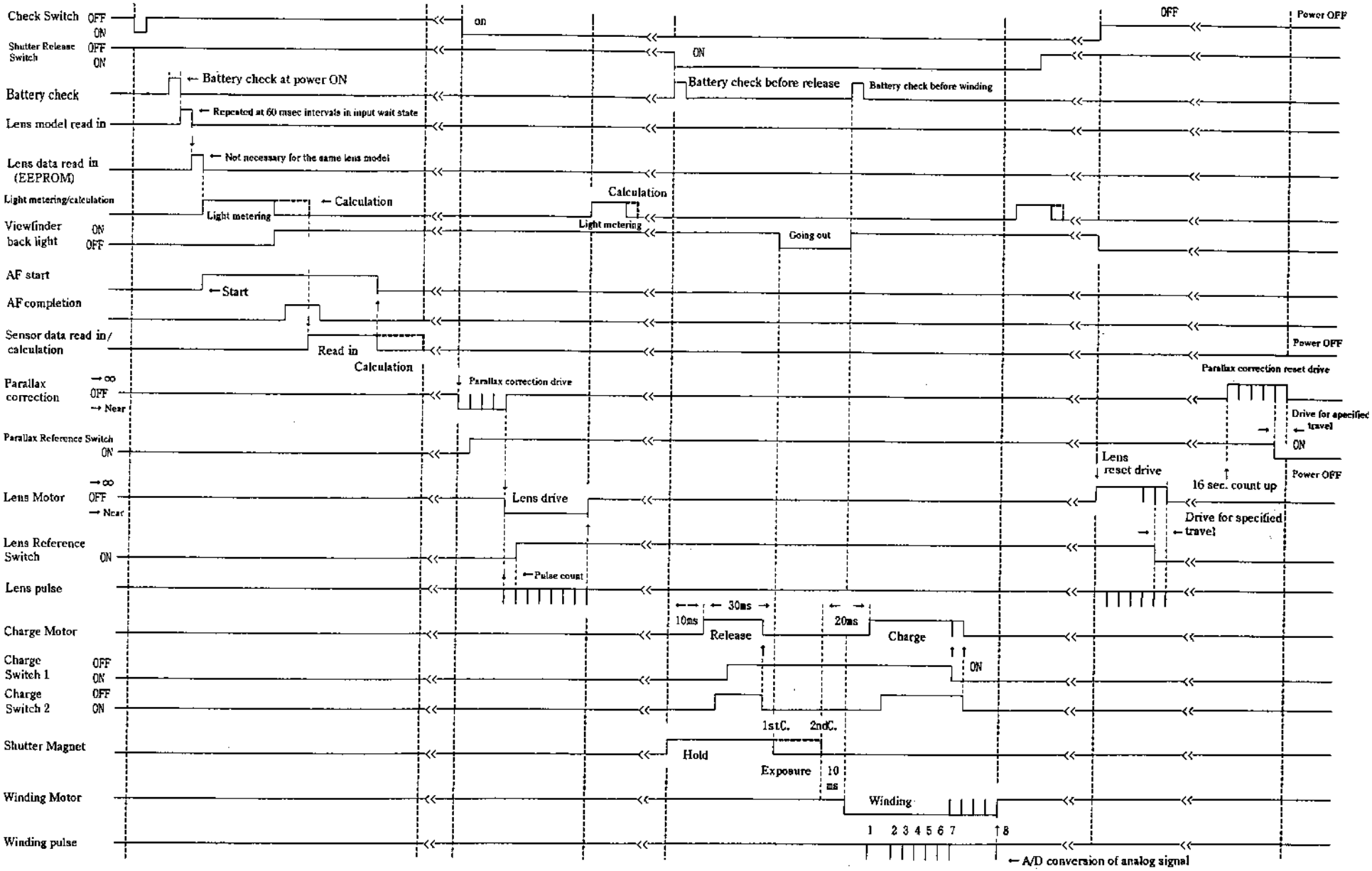
This contact reads DX codes.

㉒. DX Contact → CPU : 5 lines

Ⓐ. CPU → Data Back : Date imprinting control signal, imprinting position switching signal
The output of the camera is in the open drain or open collector state.
Ⓑ. Lens → CPU : Lens data × 3 (Lens interface signal)
Ⓒ. External flash → CPU : CH I/O (Flash charge detection)
CPU → External flash : AX signal (Flash firing with second curtain synchronization)
Ⓓ. TTL Flash Auto Control IC → External flash : CHS → CH I/O (Flash firing stop signal)
Ⓔ. Shutter → External flash : X signal

TIMING CHART

No.	419-01-50-RA1AQ01



DESCRIPTION OF ELECTRIC CIRCUIT

1. Power Supply Circuit

[1] Constitution

This circuit outputs each voltage under control of IC101. It also detects a battery voltage drop and resets IC101 by hardware.

[2] Description of Power Supply Lines

- **VCC : Power to CPU**

  At start of camera operation, IC101 turns PH1 "Low", so that IC250 (DC/DC Converter) becomes active and starts switching boosting. IC205 boosts the voltage at Pin 6 to 5.5 V and outputs 5 V (VCC) at Pin 5 through the internal series regulator.

  In standby mode, IC101 turns PH1 "Hi", thus stopping the switching operation. Then the camera enters the low power consumption state. In this state, the voltage at the battery is supplied through the diode, the Schottky diode in IC101 and the above-mentioned series regulator, so that VCC is almost the same as the battery voltage.

- **VDD : Power to peripheral circuits**

  After completion of the above-mentioned VCC boosting at start of camera operation, IC101 turns PH2 "Low", thus turning ON Q201 to supply 5 V to the VDD line.

  In standby mode, IC101 turns PH2 "Hi" to turning OFF the VDD line.

- **VL : Reference voltage for LCD Drive Circuit**

  IC 207 (regulated DC voltage IC : 1.7 V) generates this reference voltage at VCC. This voltage is tripled by the boosting circuit in IC101 and used in the LCD Drive Circuit.

- **Vref : Reference voltage for A/D conversion**

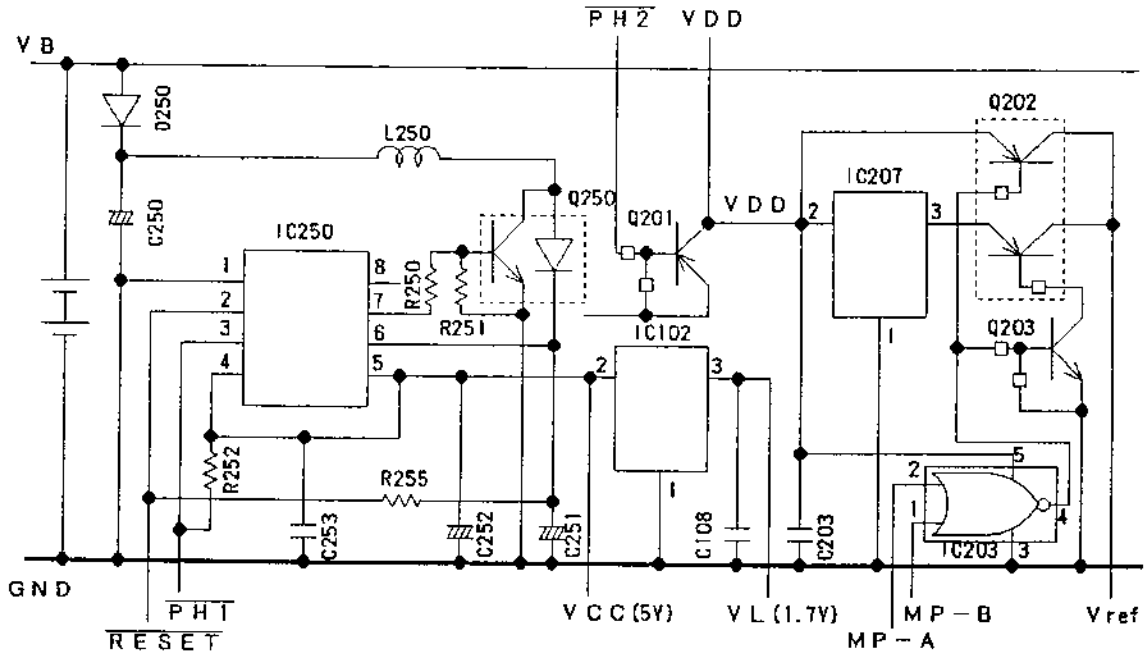
  This voltage is used as the reference voltage for the A/D conversion in IC101. Vref automatically switches between 4 V and 5 V depending on the signal from IC101 to IC203.

  (1) 4 V

  This voltage is the reference voltage that is used at the A/D conversion of the output from the Light Metering IC. IC202 (Regulated DC voltage IC : 4 V) supplies this voltage when the signals at the MP-A terminal and MP-B terminal are both "Low".

  (2) 5 V

  This voltage is the reference voltage for use at A/D conversion other than above. VDD supplies this voltage when at least one of the signals at MP-A terminal and MP-B terminal is "Hi".



2. Battery Check Circuit

[1] Constitution

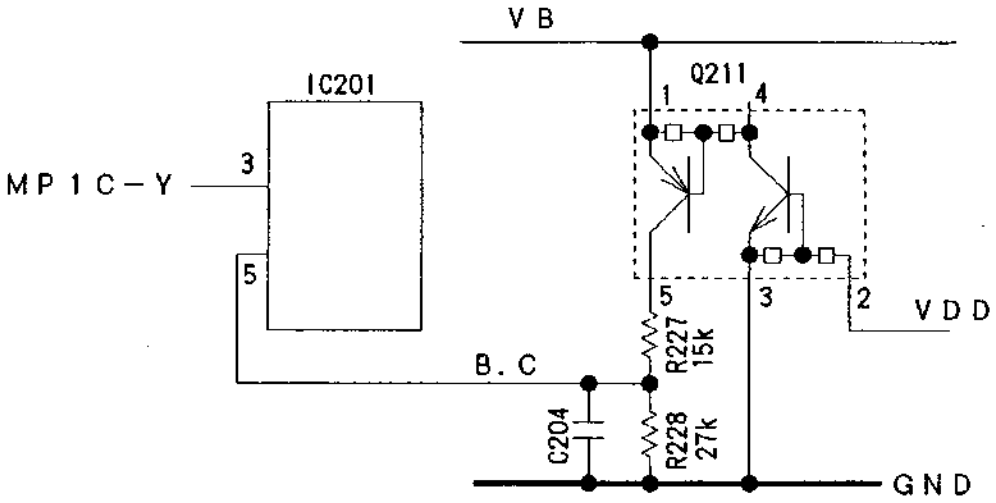
The Battery Check Circuit consists of Q211, R227, R228 and C204.

[2] Functions

VB (battery voltage) divided by R227 and R228 is input through IC201 to IC101 for checking. This voltage is stabilized by C204. When VDD is turned OFF, Q211 turns OFF to cut the current consumed by these resistors.

The voltage input to the A/D conversion port is as follows:

$$VIN = VB \times 15K / (15K + 27K) = VB \times 0.357$$



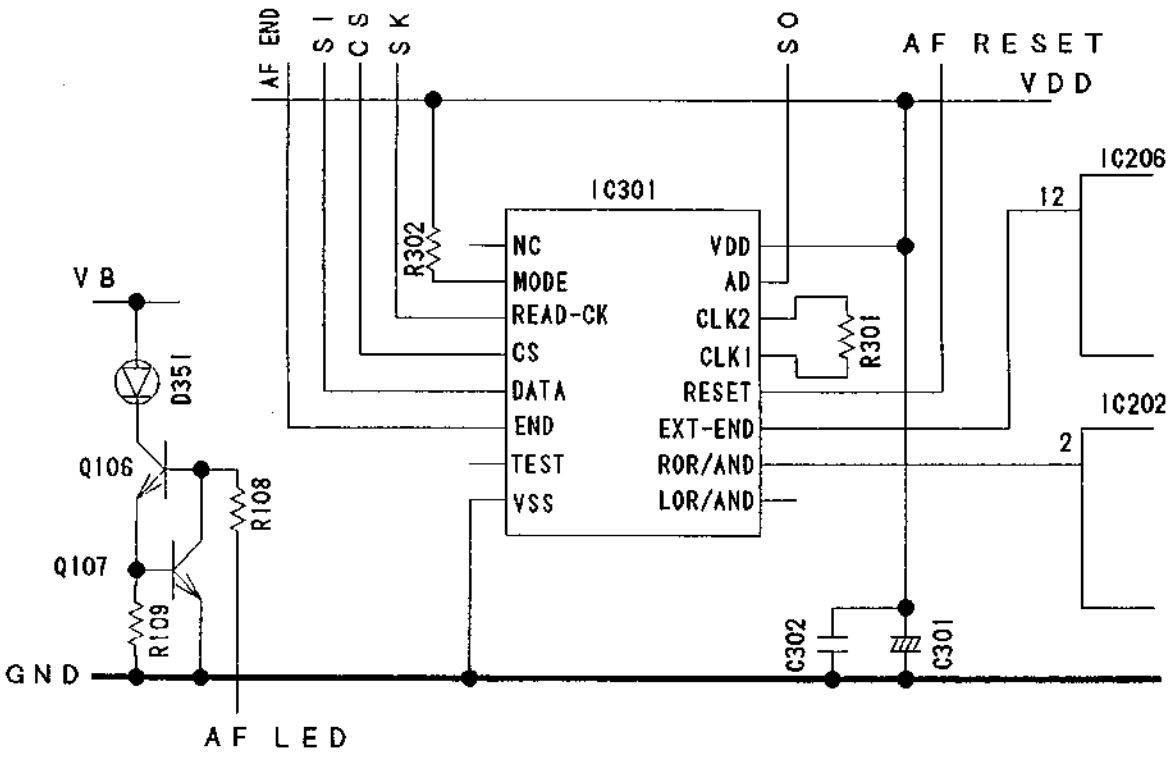
3. Auto Focusing Circuit

[1] Outline

- Auto focusing : external passive system
- After completion of accumulation, this circuit outputs the data read signal by serial communication.
- An AF-assist beam is emitted to enhance the AF detection accuracy under low light or low contrast situations

[2] Description of Control Terminals

Terminal Name	Function	I/O	Description of Function
RESET	AF start signal	I	"L": Reset, "H": AF start at rise (accumulation start)
EXT-END	Signal for externally forced stop of accumulation	I	Stops accumulation forcedly when it has not been completed in a limit time.
END	End-of-accumulation signal	O	Outputs "H" upon completion of data accumulation by IC.
READ-CK	Serial clock	I	Outputs clock to be used when IC101 reads AF data from AF-IC .
DATA	AF data	O	Outputs AF data to IC101 in synchronization with READ-CK.



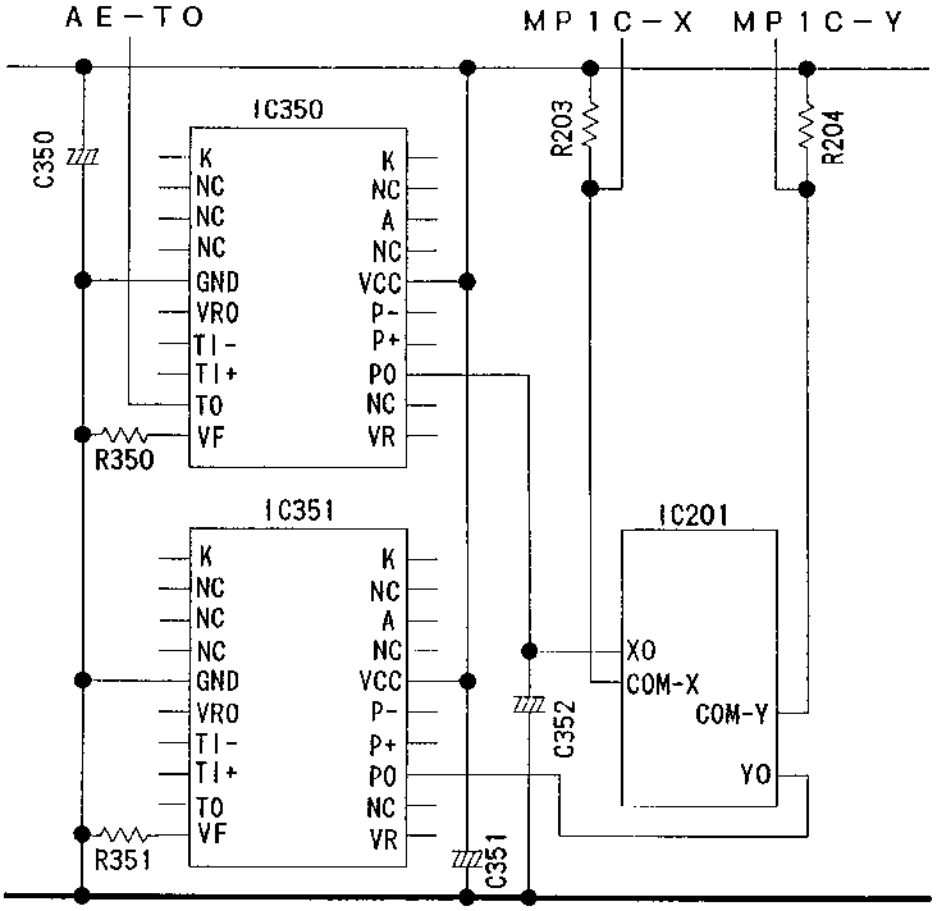
4. Light Metering Circuit

[1] Outline

- Light metering output : This circuit logarithmically compresses the photocurrent of the SPD and convents it to a voltage linear to the EV value.
- Temperature dependence : Since light metering output is dependent on temperature, IC101 compensates for the difference in the light metering output due to temperature. For this compensation, IC350 outputs the necessary temperature data as voltage.

[2] Description of Control Terminals

Terminal Name	Function	Description of Function
PO	Light metering output	Outputs voltage according to brightness.
TO	Temperature sensor output	Outputs voltage linear to temperature.



5. Motor Drive Circuit

(1) Winding/Rewind Circuit

[1] Constitution

This circuit consists of the Drive IC (IC103), the transistors Q101 and Q102 for predriving, the resistors R105 and R106 connecting the predrive transistors and the Drive IC, and protective transistor Q104.

The Drive IC (IC103) is also used in driving the AF Motor.

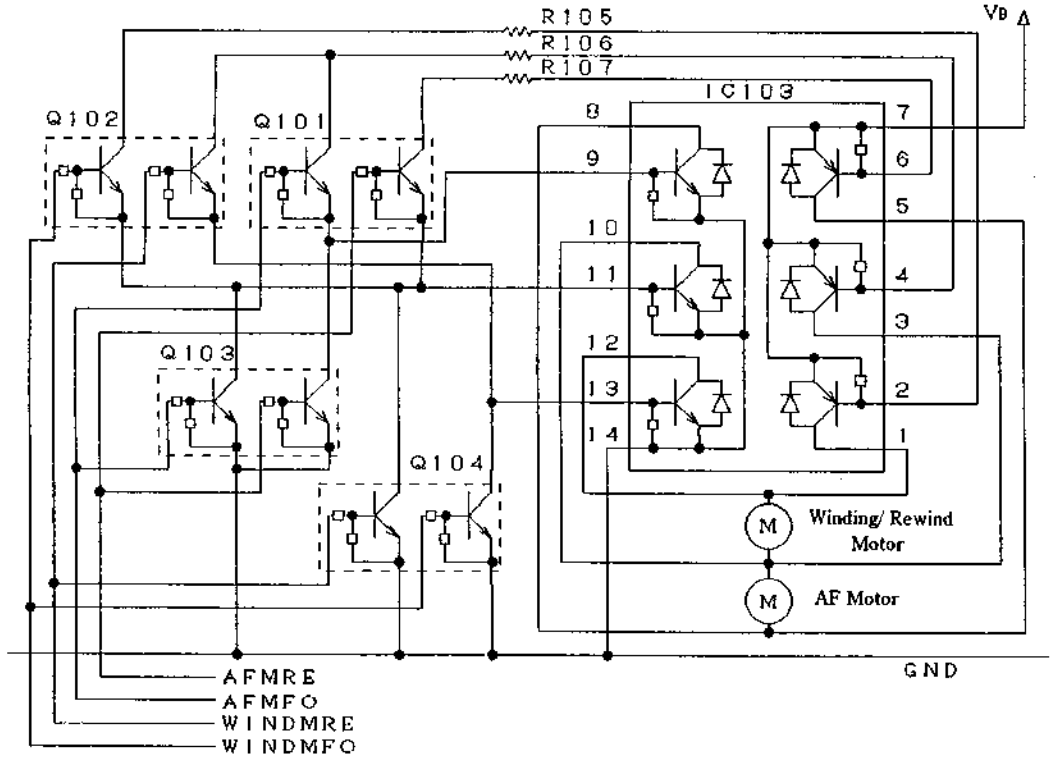
[2] Functions

Through this circuit, the CPU controls the control terminals as follows:

Pin No.	Port Name	Signal Name	Stop	Winding	Rewinding	Brake
4	P64	WINDMFO	L	H	L	H
3	P65	WINDMRE	L	L	H	H

* In this state, the AF Motor control signals "AFMFO" and "AFMRE" are both "Low".

Winding/Rewind and AF Drive Circuit Diagram



(2) AF Motor Drive Circuit

[1] Constitution

This circuit consists of the Drive IC (IC103), the transistors Q101 and Q102 for predriving, the resistors R106 and R107 connecting the predrive transistors and the Drive IC, and protective transistor Q103.

The Drive IC (IC101) is also used in driving the winding/ rewinding mechanism.

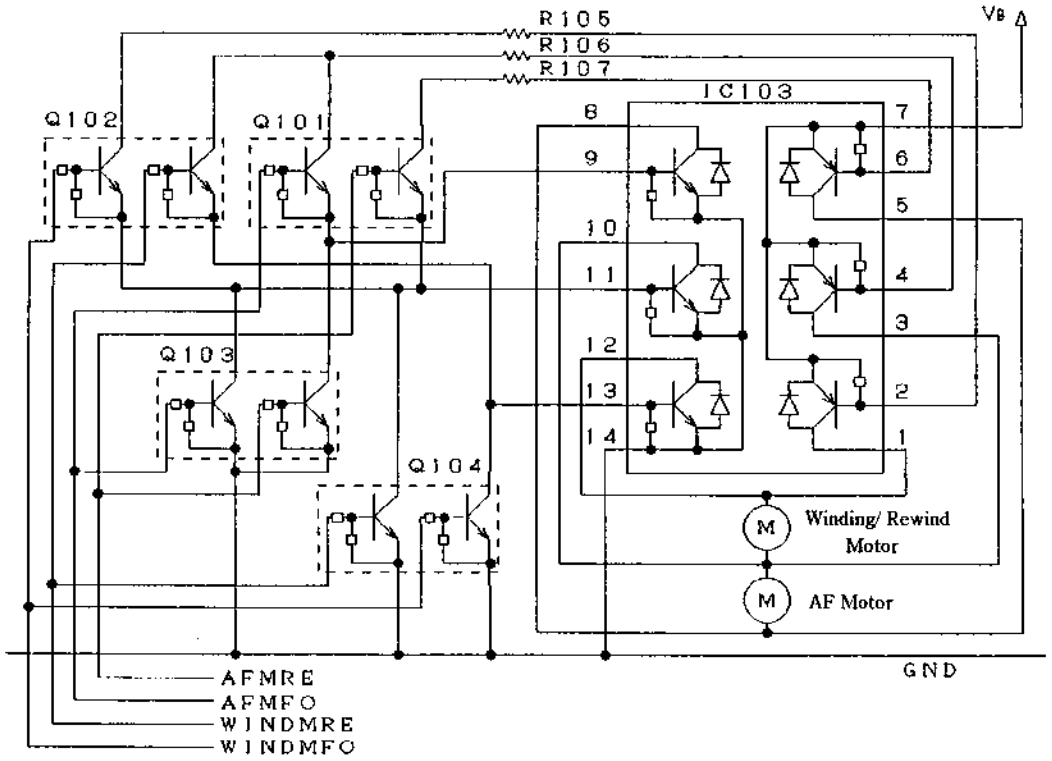
[2] Functions

Through this circuit, the CPU controls the control terminals as follows:

Pin No.	Port Name	Signal Name	Stop	Infinity → Near	Near → Infinity	Brake
2	P66	AFMFO	L	H	L	H
1	P67	AFMRE	L	L	H	H

* In this state, the Winding Motor control signals "WINDMFO" and "WINDMRE" are both "Low".

Winding/Rewind and AF Drive Circuit Diagram



(3) Charge Motor Drive Circuit

[1] Constitution

This circuit consists of the transistor Q205 for driving, the transistor Q204 for braking, Q206 and Q207 for their predriving and protection, and the resistor R212 connecting the predrive transistors and drive transistors.

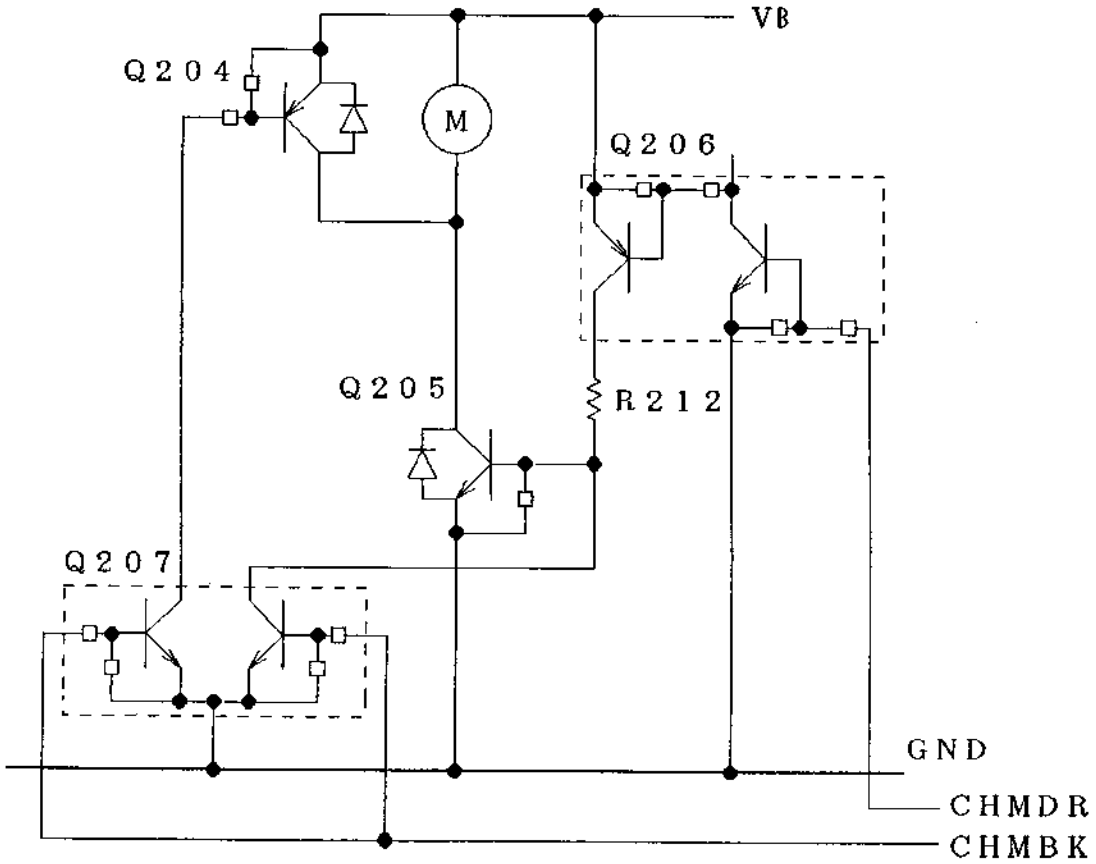
[2] Functions

Through this circuit, the CPU controls the control terminals as follows:

Pin No.	Port Name	Signal Name	Stop	Drive	Brake
27	P75	CHMDR	0	1	0
26	P76	CHMBK	0	0	1

* Charge operation is controlled by a unidirectional run.

Charge Drive Circuit Diagram



(4) Parallax Correction Drive Circuit

[1] Constitution

This circuit consists of the Pulse Motor Drive IC (IC251), the resistors R253 and R254 for reference voltage, the capacitors C254 and C255 for protection against spike voltage.

The resistors R253 and R254 for reference voltage are of ± 2% (G).

[2] Functions

The signals at the VM1 and VM2 terminals of IC251 are set to "Low", the reference voltage output from Vref is divided by R253 and R254 and input to the VC (CONTROL) terminal. Thus the pulse motor is driven at a regulated DC voltage.

Through this circuit, the CPU controls the control terminals as shown below:

ENA "Low" : Standby state — Turns OFF the output to the motor.
"Hi" : Excitation state — Turns ON the output to the motor irrespective of stop or drive state.

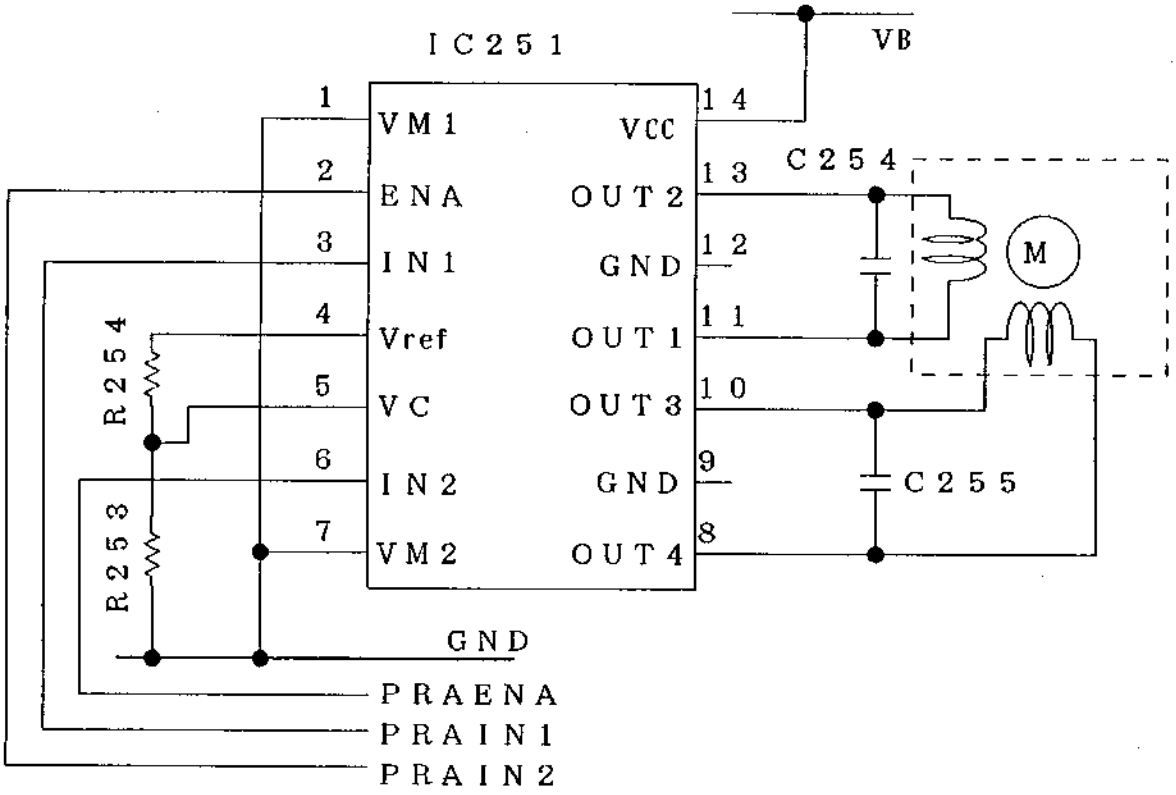
IN1 : Controls the Drive IC's outputs "OUT1" and "OUT 2" (motor terminals : phase A and phase $\overline{A}$)
IN2 : Controls the Drive IC's outputs "OUT3" and "OUT 4" (motor terminals : phase B and phase $\overline{B}$)

Excitation Pattern	Motor Terminal (Lead Wire)		$\overline{A}$ (Yellow)	A (Red)	B (Green)	$\overline{B}$ (Blue)	Direction of Drive	
	Drive IC Output / Drive IC Input		OUT1	OUT2	OUT3	OUT4	Near CW	Infinity CCW
	IN1	IN2						
1	L	H	H	L	L	H	↑	↓
2	L	L	H	L	H	L		
3	H	L	L	H	H	L		
4	H	H	L	H	L	H		

The motor does not run unless the ENA terminal signal is "Hi".

Drive IC		CPU		
Pin No.	Terminal Name	Pin No.	Port Name	Signal Name
2	ENA	30	P72	PRAENA
3	IN1	29	P73	PRAIN1
6	IN2	28	P72	PRAIN2

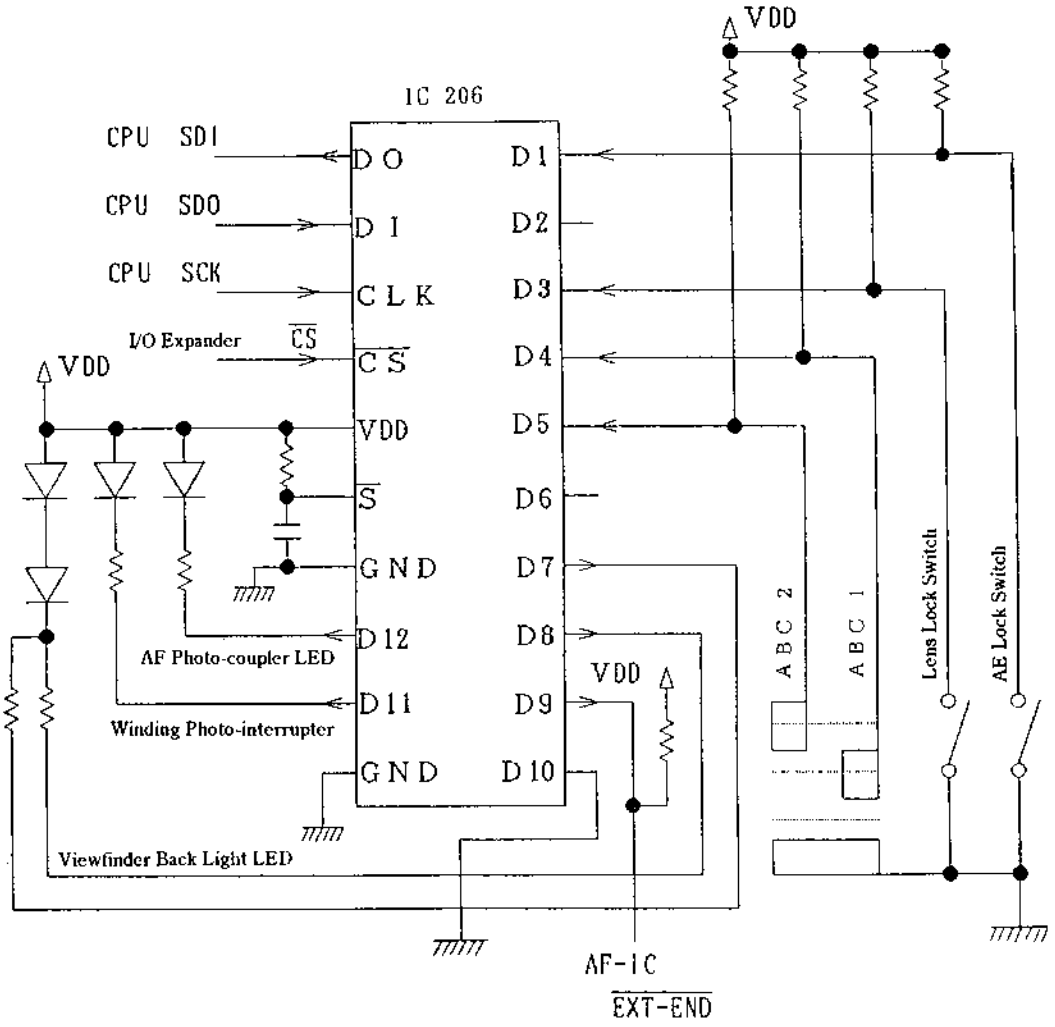
Parallax Correction Drive Circuit Diagram



6. Extension I/O Circuit

(1) I/O Expander

The I/O Expander (IC206) is used to increase the number of ports of the CPU.
The I/O Expander is controlled by serial communication (SD1, SD0, SCK) with the CPU and chip selection.



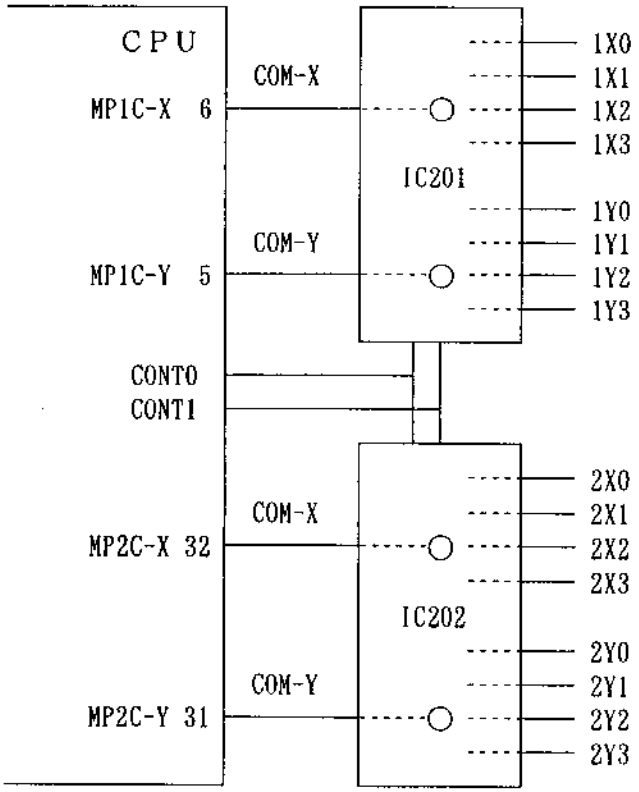
Input Terminals
- D1: AE Lock Switch
- D2: Not connected
- D3: Lens Lock Switch
- D4: A.B.C.1 (BIT0)
- D5: A.B.C.2 (BIT1)
- D6: Not connected

Output terminals
- D7: Viewfinder back light LED
- D8: Viewfinder back light LED
- D9: AF-IC EXT-END
- D10: Not connected
- D11: Winding photo-interrupter LED
- D12: AF photo-interrupter LED

(2) Analog Multiplexer

* Multiplexer ------- An electronic switch that selects one output by combining two or more inputs.
(From four inputs, one output is obtained in a 4-bit signal.)

The camera employs analog multiplexers (IC201 and IC202) to increase the number of A/D input ports of CPU and extend I/O.
There are two systems incorporating two blocks each of which selects one of the four input terminals and outputs the selected signal through the one output terminal.
The selection among the input terminals is controlled by 2-bit signals. The selecting signals are shared between the two blocks. Each IC selects two among the eight input terminals by 2-bit selecting signals and outputs the selected signals through the two output terminals. Therefore, the two ICs select four among the 16 input terminals by 2-bit selection signals and output the selected signals through the four output terminals.



Selecting Signal		CPU Input			
CONT1	CONT0	1X	1Y	2X	2Y
0	0	1X0	1Y0	2X0	2Y0
0	1	1X1	1Y1	2X1	2Y1
1	0	1X2	1Y2	2X2	2Y2
1	1	1X3	1Y3	2X3	2Y3

List of Signals Extended by Analog Multiplexers (Selecting Signals vs. Selected Signals)

Selecting Signal		CPU Inputs			
CONT1 (P15)	CONT0 (P14)	1X (AN2)	1Y (AN3)	2X (P70)	2Y (P71)
0	0	Light metering output 1	Light metering output 2	Flash ready signal (CHS)	Parallax switch
0	1	MF setting voltage	B.C. voltage	Charge switch 1	Charge switch 2
1	0	Exposure comp. setting voltage	S. time setting voltage	Not connected	AF OR/AND signal
1	1	Lens model voltage	Infinity adjustment voltage	Lens pulse 2	Lens reference position switch

DESCRIPTION OF FUNCTIONS OF IC TERMINALS

<IC101> CPU

Terminal No.	Port Name	I/O	Signal Name	Functions
1 2	P67 P66	O	AFMRE AFMF0	AF Motor control Stop Forward run Reverse run Brake AFMFO 0 1 0 1 AFMRE 0 0 1 1 Forward run : Infinity → Near Reverse run : Near → Infinity
3 4	P65 P64	O O	WINDMRE WINDMFO	Winding Motor control Stop Forward run Reverse run Brake WINDFO 0 1 0 1 WINDRE 0 0 1 1 Forward run : Winding Reverse run : Rewinding
5	AN3	I	MP1C-Y	A/D input, selected by MP-A (P14) and MP-B (P15) External light metering output, B.C. voltage, Shutter Speed Dial setting voltage, Infinity adjustment voltage
6	AN2	I	MP1C-X	A/D input, selected by MP-A (P14) and MP-B (P15) TTL light metering output, Focus Dial setting voltage, Exposure Compensation Dial setting voltage, Lens model voltage
7	AN1	I	W-PC	A/D input Perforation waveform input to winding photo-interrupter
8	AN0	I	AE-T0	A/D input AE-IC temperature output
9 10 11 12 13	P57 P56 P55 P54 P53	I I I I I	DX0 DX1 DX2 DX3 DX4	Cartridge DX detection
14	P52	O	AF-RESET	AF-IC reset signal Reset : "L"
15	INT3	I	P-ON	Power ON pulse input to Focus Dial
16	INT2	I	AF-PULS1	Lens drive detection pulse 1
17	P47	O	AF LED	AF-assist beam output
18 19 20	SCK TDK RXD	O O I	SK S0 SI	Serial communication Clock output Data output Data input Communicated with : EEPROM 1, 2, Extension I/O, AF-IC, TTL Flash Auto IC, Adjusting Tool
21	INT1	I	M SW	Main Switch OFF : "Hi", ON : "Low"
22	INT0	I	URA SW	Back Cover Switch Open : "Low", Close : "Hi"
23 24	P41 P40	O O	SH MG2 SH MG1	Control of shutter second curtain magnet Control of shutter first curtain magnet
25	P77	O	SELF	Self-timer LED Lighting : "Hi", Going out : "Low" Also used as ACK signal for serial communication with Adjusting Tool

Terminal No.	Port Name	I/O	Signal Name	Functions
26 27	P76 P75	O O	CHMBK CHMDR	Charge Motor control Stop Drive Brake CHMDR 0 1 0 CHMBK 0 0 1
28 29 30	P74 P73 P72	O O O	PRAIN2 PRAIN1 PRAENA	Control of pulse motor for field-of-view frame (parallax correction) drive
31	P71	I	MP2C-Y	Selected by MP-A (P14) and MP-B (P15) Multiplexer output signal, Parallax Switch, Charge Switch 2, AF OR/AND signal, Lens Reference Position Switch
32	P70	I	MP2C-X	Selected by MP-A (P14) and MP-B (P15) Multiplexer output signal, Flash ready signal (CHS), Charge Switch 1, AF END signal, Lens drive pulse 2
33	$\overline{\text{RESET}}$	I	$\overline{\text{RESET}}$	CPU reset signal
34 35	XCIN XCOUT			32 kHz oscillator connection
36 37	XIN XOUT			8 MHz oscillator connection
38	VSS		GND	CPU power grounding (0 V)
39	P27	O	PH1	DC-DC chip select signal ("L": ON)
40	P26	O	PH2	VDD ON : "Low", OFF : "Hi"
41	P25	I	TEST	Transition to test mode "Low": test, "Hi": normal
42	P24	I	REWIND	Input to Rewind Switch
43	P23	I	ISO	Input to ISO (DOWN) Button Switch
44	P22	I	DRIVE	Input to Drive (UP) Button Switch
45	P21	I	REL	Input to Shutter Release Switch
46	P20	I	CHK	Input to Check Switch
47	P17	O	$\overline{\text{CHC}}$	TTL Flash Auto IC Control signal for received light accumulation
48	P16	O	D-X	Auto Date module imprinting signal
49 50	P15 P14	O O	MP-B MP-A	Selection control of signals to MPIC-Y, MPIC-X, MP2C-X, MP2C-X
51	P13	O	I-O/$\overline{\text{CS}}$	Extension I/O chip select signal Select : "Low" Not select : "Hi"
52	P12	O	CHIC/$\overline{\text{CS}}$	TTL Flash Auto IC chip select signal Select : "Low" Not select : "Hi"
53	P11	O	AFIC-CS	AF-IC chip select signal Select : "Hi" Not select : "Low"

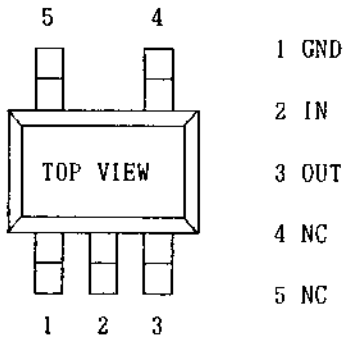
Terminal No.	Port Name	I/O	Signal Name	Description of Functions
54	P10	O	PROM1-CS	EEPROM1 (for Body) chip select signal — Select : "Low" / Not select : "Hi"
55	P07	O	PROM2-CS	EEPROM2 (for Lens) chip select signal — Select : "Low" / Not select : "Hi"
56	P06	O	AX	Hot Shoe AX signal
57	SEG31	O	SEG31	Counter LCD Indication: 1b, 2b, 2f
58	SEG30	O	SEG30	1g, 1a, 1c
59	SEG29	O	SEG29	1e, 1f, 1d
60	SEG28	O	SEG28	2c, 2g, 2a, 2d
61	SEG27	O	SEG27	Mode LCD Indication: 4g, 4e, 4a
62	SEG26	O	SEG26	4c, 4d, 4b
63	SEG25	O	SEG25	3e, 3d, 3f
64	SEG24	O	SEG24	3g, 3c, 3a
65	SEG23	O	SEG23	2g, 2e, 2a
66	SEG22	O	SEG22	2c, 2d, 2b
67	SEG21	O	SEG21	1e, 1d, 1f
68	SEG20	O	SEG20	1g, 1c, 1a
69	SEG19	O	SEG19	1b, ／, DX
70	SEG18	O	SEG18	2f, ⏲, ▭
71	SEG17	O	SEG17	3d, C, 1S0
72	SEG16	O	SEG16	S, , 4f
73	SEG15	O	SEG15	Viewfinder LCD Indication: 2b, , 2c
74	SEG14	O	SEG14	2f, , 2e
75	SEG13	O	SEG13	3f, ϟ, 3e
76	SEG12	O	SEG12	S2, R8, R5
77	SEG11	O	SEG11	R6, R7,
78	SEG10	O	SEG10	R3, R2, R4
79	SEG9	O	SEG9	R1, S1
80	SEG8	O	SEG8	4g, 4f, 4d
81	SEG7	O	SEG7	4e, R9
82	SEG6	O	SEG6	4d, 4a, 4c
83	SEG5	O	SEG5	3g, 3a, 3d
84	SEG4	O	SEG4	3d, ／, 3c
85	SEG3	O	SEG3	2g, 2a, 2d
86	SEG2	O	SEG2	1f, 1a, 1e
87	SEG1	O	SEG1	1g, 1b, 1d
88	SEG0	O	SEG0	1c, ▲, ▼
89	VCC		VCC	CPU power input (4.5 to 5.5 V)
90	VREF		VREF	A/D conversion reference voltage input
91	AVSS		AVSS	CPU analog grounding (0 V)
92	COM3	-	-	Not used
93	COM2	O	COM2	LCD common output, used by 3-time-division
94	COM1	O	COM1	
95	COM0	O	COM0	

Terminal No.	Port Name	I/O	Signal Name	Functions
96 97 98 99 100	VL3 VL2 C2 C1 VL1		VL3 VL2 C2 C1 VL1	LCD power input Applies voltages as 0≦VL1≦VL2≦VL3 For boosting circuit ↑ Power input

<IC102> Regulated DC Voltage IC

Pin No.	Terminal Name	I/O	Description of Functions
1	GND	-	Grounding terminal
2	IN	I	Voltage input terminal (VCC input)
3	OUT	O	Voltage output terminal (1.7 V output)
4	NC	-	Not used
5	NC	-	Not used

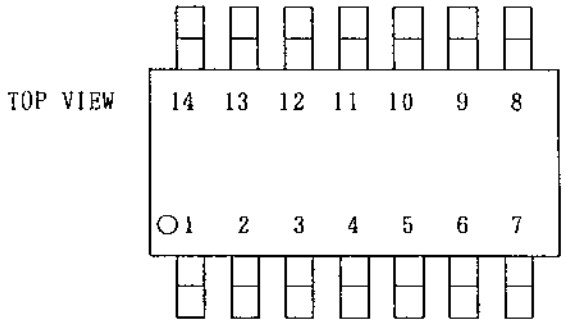
(IC102 Regulated DC Voltage IC Pin Arrangement)



<IC103> AF/Winding Motor Drive IC

Pin No.	Terminal Name	I/O	Description of Functions
1	PNP1 Collector	O	AF Motor forward run : PNP2, NPN1 ON AF Motor reverse run : PNP3, NPN2 ON AF Motor brake : PNP2, PNP3 ON Winding Motor forward run : PNP1, NPN2 ON Winding Motor reverse run : PNP2, NPN3 ON Winding Motor brake : PNP1, PNP3 ON All the transistors that are not specified above : OFF CPU controls by four ports : P1 : "H" → AF reverse run P2 : "H" → AF forward run P3 : "H" → WIND reverse run P4 : "H" → WIND forward run P1, P2 : "H" → AF brake P3, P4 : "H" → WIND brake
2	PNP1 Base	I	
3	PNP2 Collector	O	
4	PNP2 Base	I	
5	PNP3 Collector	O	
6	PNP3 Base	I	
7	PNP Emitter	-	
8	NPN1 Collector	O	
9	NPN1 Base	I	
10	NPN2 Collector	O	
11	NPN2 Base	I	
12	NPN3 Collector	O	
13	NPN3 Base	I	
14	NPN Emitter	-	

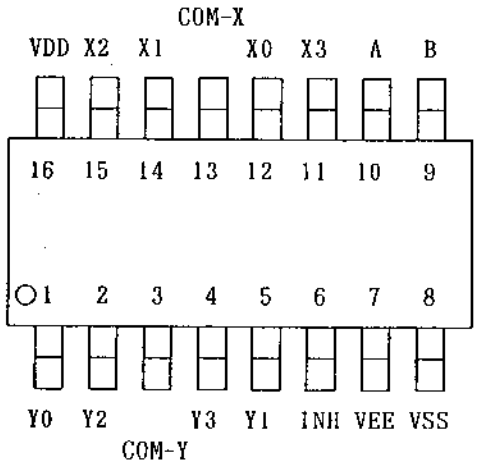
(IC103 AF/Winding Motor Drive IC Pin Arrangement)



<IC201> Analog Multiplexer

Pin No.	Terminal Name	I/O	Description of Functions
1	Y0	I	Light metering output 2
2	Y2	I	S. time setting voltage
3	COM-Y	O	MP1C-Y
4	Y3	I	Infinity adjustment voltage
5	Y1	I	B.C. voltage
6	INH	I	Connected to GND
7	VEE	-	Connected to GND
8	VSS	-	Grounding
9	B	I	CONT1
10	A	I	CONT0
11	X3	I	Lens model voltage
12	X0	I	Light metering output 1
13	COM-X	O	MP1C-X
14	X1	I	MF setting voltage
15	X2	I	Exposure compensation setting voltage
16	VDD	-	Circuit power

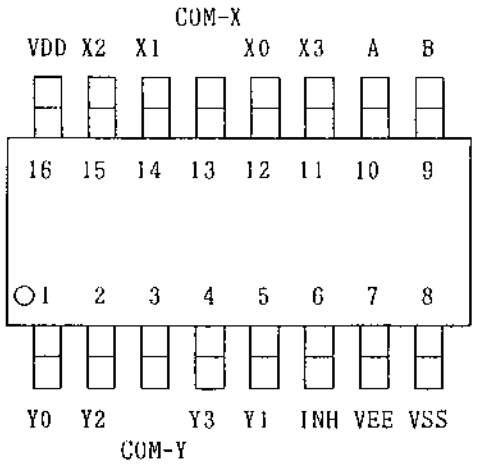
(IC201 Analog Multiplexer Pin Arrangement)



<IC202> Analog Multiplexer

Pin No.	Terminal Name	I/O	Description of Functions
1	Y0	I	Parallax Switch
2	Y2	I	AF OR/AND signal
3	COM-Y	O	MP2C-Y
4	Y3	I	Lens Reference Position Switch
5	Y1	I	Charge Switch 2
6	INH	I	Connected to GND
7	VEE	-	Connected to GND
8	VSS	-	Grounding
9	B	I	CONT1
10	A	I	CONT0
11	X3	I	Lens pulse 2
12	X0	I	Flash ready signal (CHS)
13	COM-X	O	MP2C-X
14	X1	I	Charge Switch 1
15	X2	I	AF END signal
16	VDD	-	Circuit power

(IC202 Analog Multiplexer Pin Arrangement)



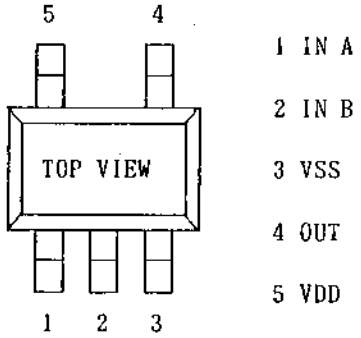
<IC203> NOR Gate

Pin No.	Terminal Name	I/O	Description of Functions
1	IN B	I	Input terminal B
2	IN A	I	Input terminal A
3	VSS	-	Power supply terminal (Grounding)
4	OUT	O	Output terminal
5	VDD	-	Power supply terminal

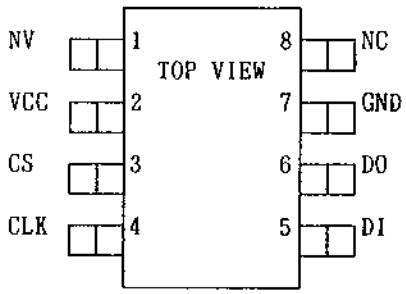
<IC204> EEPROM1

Pin No.	Terminal Name	I/O	Description of Functions
1	NV	-	Not used
2	VCC	-	Circuit power
3	CS	I	Chip select signal input
4	CLK	I	Clock input
5	DI	I	Serial data input
6	DO	O	Serial data output
7	GND	-	Power supply grounding
8	NC	-	Not used

(IC203 NOR Gate Pin Arrangement)



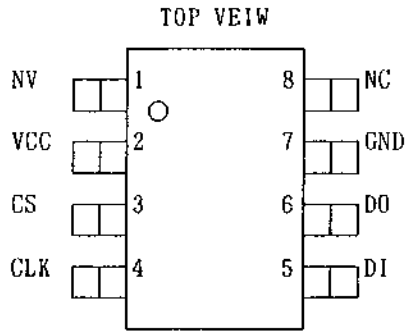
(IC204 EEPROM1 Pin Arrangement)



<IC205> EEPROM2 (Lens ROM)

Pin No.	Terminal Name	I/O	Description of Functions
1	NV	-	Not used
2	VCC	-	Circuit power
3	CS	I	Chip select signal input
4	CLK	I	Clock input
5	DI	I	Serial data input
6	DO	O	Serial data output
7	GND	-	Power supply grounding
8	NC	-	Not used

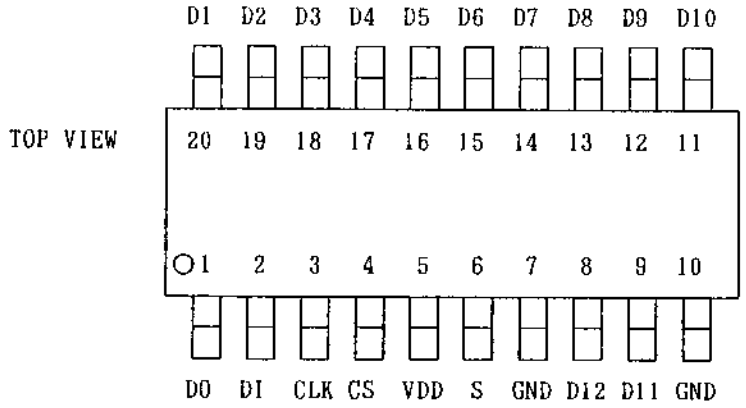
(IC205 EEPROM2 Pin Arrangement)



<IC206> I/O Expander

Pin No.	Terminal Name	I/O	Description of Functions
1	DO	O	Serial communication data output
2	DI	I	Serial communication data input
3	CLK	I	Serial communication clock input
4	CS	I	Chip select signal
5	VDD	-	Circuit power
6	S	I	Setting input
7	GND	-	Circuit grounding
8	D12	O	AF photo-interrupter LED output
9	D11	O	Winding photo-interrupter LED output
10	GND	-	Circuit grounding
11	D10	I/O	Connected to GND (Not used)
12	D9	I/O	AF-IC EXT-END output
13	D8	I/O	Viewfinder back light LED output
14	D7	I/O	Viewfinder back light LED output
15	D6	I/O	Connected to GND (Not used)
16	D5	I/O	A.B.C. 2 input
17	D4	I/O	A.B.C. 1 input
18	D3	I/O	Lens Lock Switch input
19	D2	I/O	Connected to GND (Not used)
20	D1	I/O	AE Lock Switch input

(IC206 I/O Expander Pin Arrangement)



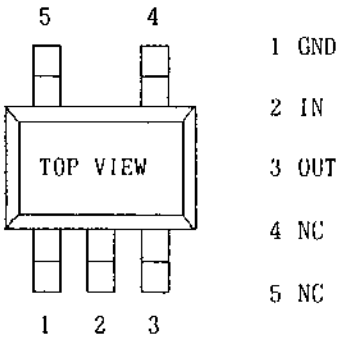
<IC207> Regulated DC Voltage IC

Pin No.	Terminal Name	I/O	Description of Functions
1	GND	-	Grounding terminal
2	IN	I	Voltage input terminal (VDD input)
3	OUT	O	Voltage output terminal (4 V output)
4	NC	-	Not used
5	NC	-	Not used

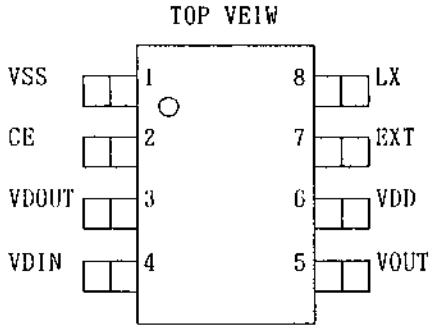
<IC250> DC/DC Converter

Pin No.	Terminal Name	I/O	Description of Functions
1	VSS	-	Grounding terminal
2	CE	I	Chip enable terminal
3	VDOUT	O	Voltage detector output terminal
4	VDIN	I	Voltage detector input terminal
5	VOUT	O	Regulator output terminal (5.0 V output)
6	VDD	O	Boosted output terminal
7	EXT	O	External transistor drive terminal
8	LX	-	Not used

(IC207 Regulated DC Voltage IC Pin Arrangement)



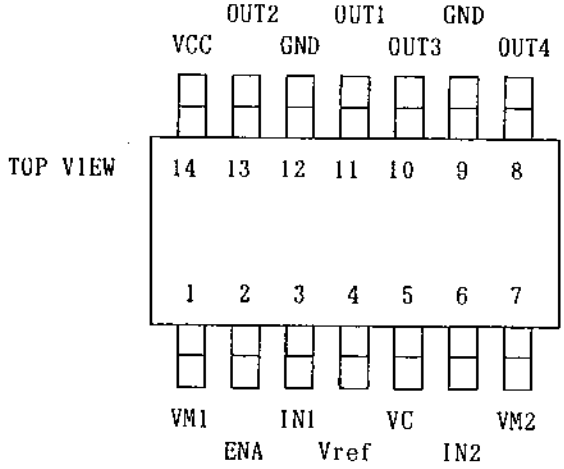
(IC250 DC/DC Converter Pin Arrangement)



<IC251> Parallax Motor Drive IC

Pin No.	Terminal Name	I/O	Description of Functions
1	VM1	I	Input terminal for Regulated DC Power Supply drive selection Fixed to "L"
2	ENA	I	IC operation selection terminal "L" : standby state "H" : drive (operation) state
3	IN1	I	Input terminal for drive direction selection "L" : forward run "H" : reverse run
4	Vref	I	Reference voltage input terminal
5	VC	I	Output control voltage. Output voltage : 2.5 × VC
6	IN2	I	Input terminal for drive direction selection "L" : forward run "H" : reverse run
7	VM2	I	Input terminal for Regulated DC Power Supply drive selection Fixed to "L"
8	OUT4	O	Output terminal
9	GND	-	Circuit grounding
10	OUT3	O	Output terminal
11	OUT1	O	Output terminal
12	GND	-	Circuit grounding
13	OUT2	O	Output terminal
14	VCC	-	Circuit power

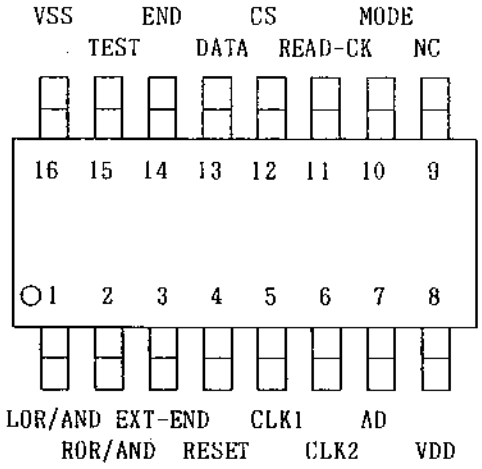
(IC251 Parallax Motor Drive IC Pin Arrangement)



<IC301> AF-IC

Pin No.	Terminal Name	I/O	Description of Functions
1	LOR / AND	O	OR/AND output of left sensor array. Not connected
2	ROR / AND	O	OR/AND output of right sensor array
3	EXT-END	I	Input of "L" stops sensor operation forcibly. (Pull-up resistor incorporated)
4	RESET	I	IC reset terminal (reset at "L", pull-up resistor incorporated)
5	CLK1	-	Terminal to mount external resistor for oscillator
6	CLK2	-	Terminal to mount external resistor for oscillator
7	AD	I	Input terminal for the first address of calculation start and sensor data output area (Pull-up resistor incorporated)
8	VDD	-	Power terminal
9	NC	-	Not used
10	MODE	I	"L" : AF mode, "H" : Sensor mode
11	READ-CK	I	Control signal for address input and data output (Pull-up resistor incorporated)
12	CS	I	Chip select ("L" : DATA terminal ---- High impedance "H" : DATA terminal ----Data output)
13	DATA	O	Data output terminal
14	END	O	"L" : Sensor operation state, data output state "H" : Address input state
15	TEST	I	Test terminal for use by manufacturer. Normal operation at "L" or in "open" state. Not connected
16	VSS	-	Power terminal (Grounding)

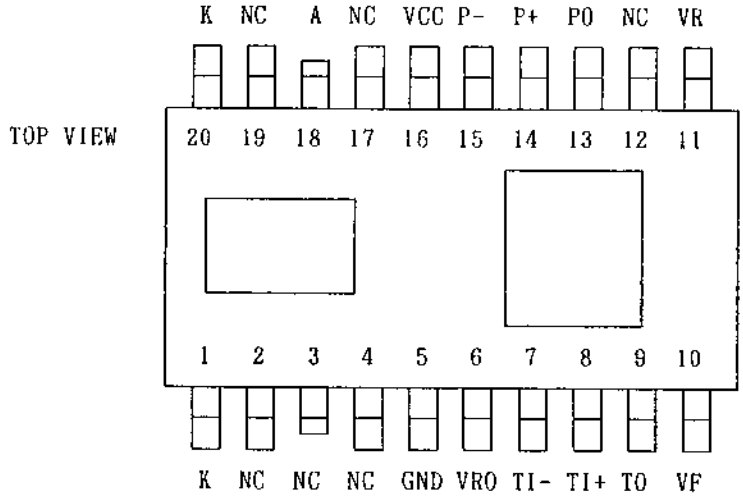
(IC301 AF-IC Pin Arrangement)



<IC350, 351> Light Metering IC

Pin No.	Terminal Name	I/O	Description of Functions
1	K	-	Photodiode cathode. Not connected
2,3,4	NC	-	Not used
5	GND	I	Circuit grounding
6	VRO	I	Internal reference voltage terminal. Not connected
7	TI −	I	Inversion input terminal of temperature sensor amplifier. Not connected
8	TI+	I	Non-inversion input terminal of temperature sensor amplifier. Not connected
9	TO	O	Output terminal of temperature sensor amplifier
10	VF	I	Light metering output adjustment terminal. Adjustment range: ± 1 EV
11	VR	O	Output terminal for A/D conversion reference voltage. Not connected
12	NC	-	Not used
13	PO	O	Light metering value output terminal
14	P+	I	Non-inversion input terminal of light metering amplifier. Not connected
15	P−	I	Inversion input terminal of light metering amplifier. Not connected
16	VCC	-	Circuit power
17	NC	-	Not used
18	A	-	Photodiode anode. Not connected
19	NC	-	Not used
20	K	-	Photodiode cathode. Not connected

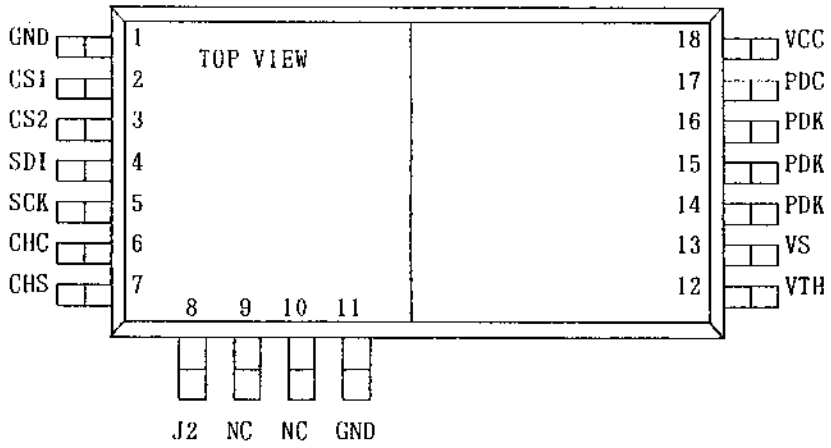
(IC350, 351 Light Metering IC Pin Arrangement)



<IC401> TTL Flash Auto IC

Pin No.	Terminal Name	I/O	Description of Functions
1	GND	-	Grounding terminal
2	CS1	I	Chip select signal 1 (Selection at "L")
3	CS2	I	Chip select signal 2 (Connected to GND)
4	SD1	I	Input terminal for ISO data serial data
5	SCK	I	Serial clock input terminal
6	CHC	I	Input terminal for TTL Flash Auto control start signal (TTL Flash Auto control operation during "L")
7	CHS	O	Output terminal for TTL Flash Auto control stop signal (Stop at "L" → "H")
8	J2	-	Not used
9	NC	-	Not used
10	NC	-	Not used
11	GND	-	Not used
12	VTH	-	Reference voltage for TTL Flash Auto control integration (Varies with ISO)
13	VS	O	Reference voltage output terminal
14	PDK	-	Not used
15	PDK	-	Internal SPD connecting terminal : Cathode
16	PDK	-	Not used
17	PDC	-	Internal SPD connecting terminal : Anode
18	VCC	-	Power terminal

(IC401 TTL Flash Auto IC Pin Arrangement)



DESCRIPTION OF FUNCTIONS OF ELECTRIC PARTS

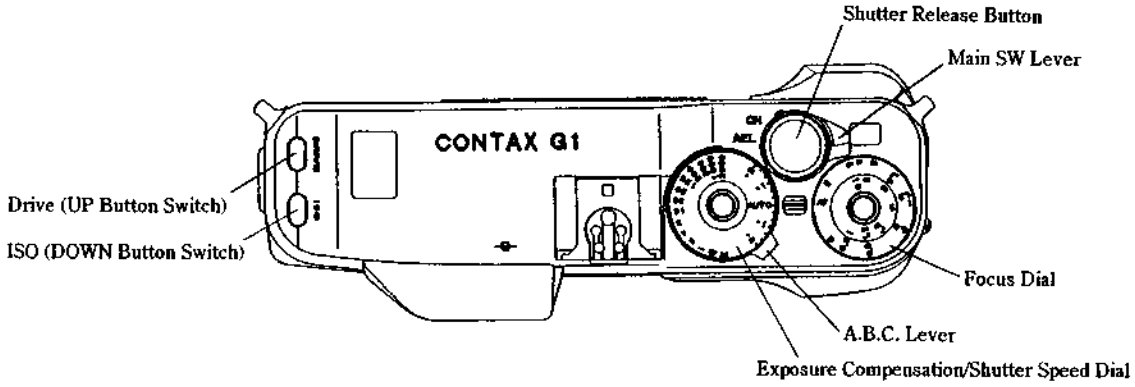
Symbol	Name	Rating	Functions
IC101	CPU	M38254M6PGP	Sequence control Display control (LCD, LED) Power circuit control Input read in(Switch, analog value detection) Sensor read in(AF, light metering) Peripheral circuit control (Shutter, winding, lens drive, etc.)
IC102	REG-IC	S81217SG	Reference voltage output for LCD power
IC103	Motor Drive IC	MDC03	AF/Winding Motor drive IC
IC201	Analog Multiplexer	4052BCF	CPU port extension (analog port)
IC202	Analog Multiplexer	4052BCF	CPU port extension (analog port)
IC203	NOR Gate	7S02	Vref switching
IC204	EEPROM	93LC468XTI/SN	Memory for backup data, counter, status information
IC205	EEPROM	S2934AIF10	Lens data memory
IC206	I/O Expander	M6606FP	CPU port extension (logic port)
IC207	REG-IC	RN5RL40AA	Reference voltage output for A/D conversion during light metering
IC250	DC/DC Converter	RS5RM5040B	Power supply circuit for the system
IC251	Motor Drive IC	LB1839M	Parallax Motor drive IC
IC301	AF-IC	FB6222T	Auto focusing IC
IC350	Light Metering IC	S5998	Light metering IC (TTL light metering)
IC351	Light Metering IC	S59O98	Light metering IC (External light metering)
IC401	TTL Flash Auto IC	T1948F	TTL Flash Auto Control IC
Q101	Double NPN Transistor	IMH10A	Predriving of AF Motor Drive Circuit
Q102	Double NPN Transistor	IMH10A	Predriving of Winding Motor Drive Circuit
Q103	Double NPN Transistor	IMH10A	Prevention of through-current in AF Motor Drive Circuit
Q104	Double NPN Transistor	IMH10A	Prevention of through-current in Winding Motor Drive Circuit
Q105	NPN Transistor	DTC114YUA	Inversion of Data Back imprinting signal
Q106	NPN Transistor	2SC4577	Low current drive circuit for AF-assist beam circuit
Q107	NPN Transistor	2SC4639	Low current drive circuit for AF-assist beam circuit
Q201	PNP Transistor	DTA123JUA	Peripheral circuit power (VDD) switching
Q202	Double PNP Transistor	IMB4A	Reference voltage switching for A/D conversion
Q203	NPN Transistor	DTC14YUA	Reference voltage switching for A/D conversion
Q204	PNP Power Transistor	2SB1394	Braking of Charge Motor Drive Circuit
Q205	NPN Power Transistor	2SD1999	Driving of Charge Motor Drive Circuit
Q206	NPN, PNP Transistor	FNC5A	Driving of Charge Motor Drive Circuit
Q207	Double NPN Transistor	FC146	Braking of Charge Motor Drive Circuit
Q208	Double NPN Transistor	FC146	Shutter drive
Q209	Double NPN Transistor	FC104	Waveform rectification of AF photo-coupler signal
Q210	NPN Transistor	DTC114YUA	Self-timer LED drive
Q211	NPN, PNP Transistor	FMC5A	B.C. circuit switching
Q212	NPN Transistor	DTC114YUA	Inversion of Accessory Shoe AX signal

Symbol	Name	Rating	Functions
Q250	NPN Transistor with D	FP301	Coil switching
Q401	NPN Transistor	DTC123JUA	Inversion of Accessory Shoe CH I/O signal
C101	Ceramic Capacitor	0.47μ	Stabilization of CPU power
C103	Ceramic Capacitor	0.47μ	LCD drive 1/3 bias boosting
C104	Ceramic Capacitor	0.47μ	LCD drive 1/3 bias boosting
C105	Ceramic Capacitor	0.47μ	LCD drive 1/3 bias boosting
C106	Ceramic Capacitor	22P	Stabilization of sub clock oscillation of CPU
C107	Ceramic Capacitor	22P	Stabilization of sub clock oscillation of CPU
C108	Ceramic Capacitor	0.47μ	Stabilization of LCD drive power
C110	Ceramic Capacitor	0.01μ	Stabilization of Vout terminal of DC/DC Converter
C201	Ceramic Capacitor	0.1μ	Reset circuit of I/O Expander
C202	Ceramic Capacitor	0.01μ	Vref voltage stabilization
C203	Ceramic Capacitor	0.1μ	VDD voltage stabilization
C204	Ceramic Capacitor	0.01μ	Stabilization of battery check line
C205	Ceramic Capacitor	3300P	Base voltage stabilization of waveform rectification transistor for AF coupler
C250	Tantalum Capacitor	68μ / 7V	Input voltage stabilization
C251	Tantalum Capacitor	22μ / 7V	Smoothing capacitor
C252	Tantalum Capacitor	68μ / 7V	VCC voltage stabilization
C253	Ceramic Capacitor	0.1μ	VCC voltage stabilization
C254	Ceramic Capacitor	0.01μ	Protective capacitor for Parallax Motor
C255	Ceramic Capacitor	0.01μ	Protective capacitor for Parallax Motor
C301	Tantalum Capacitor	6.8μ / 7V	AF-IC power stabilization
C302	Ceramic Capacitor	0.1μ	AF-IC power stabilization
C350	Tantalum Capacitor	22μ / 7V	Light Metering IC power stabilization
C351	Tantalum Capacitor	6.8μ / 7V	Light Metering IC stabilization
C352	Tantalum Capacitor	6.8μ / 7V	Light metering output stabilization
C401	Ceramic Capacitor	0.01μ	Stabilization of TTL Flash Auto Control VTH
C402	Ceramic Capacitor	39P	TTL Flash Auto control integration
C403	Ceramic Capacitor	0.1μ	TTL Flash Auto IC stabilization
R101	Resistor	15KΩ 1/16W	Pull-up resistance of COM-X terminal of analog multiplexer (IC202)
R102	Resistor	10MΩ 1/16W	Oscillator circuit feedback resistor
R103	Resistor	220KΩ 1/16W	Oscillation stabilization
R104	Resistor	1MΩ 1/16W	Pull-up resistance of Back Cover Switch
R105	Resistor	100Ω 1/8W	Base current limiting of Winding Motor drive transistor
R106	Resistor	100Ω 1/8W	Base current limiting of AF/Winding Motor drive transistor
R107	Resistor	100Ω 1/8W	Base current limiting of AF Motor drive transistor
R108	Resistor	2KΩ 1/16W	Base current limiting of AF-assist Beam LED drive transistor
R109	Resistor	3Ω 1/4W	Current limiting of AF-assist Beam LED
R110	Resistor	5.1KΩ 1/16W	Load resistance to phototransistor
R111	Resistor	5.1KΩ 1/16W	Load resistance to phototransistor
R112	Resistor	1MΩ 1/16W	Pull-up resistance of Main Switch
R113	Resistor	1MΩ 1/16W	Pull-up resistance of power ON detection of Focus Dial
R203	Resistor	1MΩ 1/16W	Pull-up resistance of COM-X terminal of analog multiplexer (IC201)
R204	Resistor	1MΩ 1/16W	Pull-up resistance of COM-Y terminal of analog multiplexer (IC201)
R205	Resistor	100KΩ 1/16W	Pull-up resistance of S terminal of I/O Expander
R206	Resistor	10KΩ 1/16W	Pull-up resistance of A.B.C. (± 1) input
R207	Resistor	10KΩ 1/16W	Pull-up resistance of A.B.C. (± 0.5) input

Symbol	Name	Rating		Functions
R208	Resistor	10KΩ	1/16W	Pull-up resistance of Lens Lock Switch
R210	Resistor	10KΩ	1/16W	Pull-up resistance of AE Lock input
R212	Resistor	100Ω	1/8W	Base current limiting of Charge Motor Drive Circuit transistor
R215	Resistor	56KΩ	1/16W	Pull-down resistance of pulse signal of Winding Photo-interrupter
R216	Resistor	680Ω	1/16W	Photodiode current limiting of Winding Photo-interrupter
R218	Resistor	2KΩ	1/16W	Output voltage division of AF photo-coupler signal waveform
R219	Resistor	10KΩ	1/16W	Pull-up resistance of AF Pulse2 signal of AF photo-coupler
R220	Resistor	10KΩ	1/16W	Pull-up resistance of AF Pulse1 signal of AF photo-coupler
R222	Resistor	2KΩ	1/16W	Output voltage division of AF photo-coupler signal waveform
R223	Resistor	330Ω	1/16W	Protective resistance of AF photo-coupler LED
R225	Resistor	1KΩ	1/16W	Prevention of static electricity at CH I/O terminal of Accessory Shoe
R226	Resistor	330Ω	1/16W	Current limiting of Self-timer LED
R227	Resistor	15KΩ	1/16W	VB voltage division of Battery Check Circuit
R228	Resistor	27KΩ	1/16W	VB voltage division of Battery Check Circuit
R230	Resistor	330Ω	1/16W	Current restriction at high brightness of Viewfinder Back Light LED
R231	Resistor	200Ω	1/16W	Current restriction at low brightness of Viewfinder Back Light LED
R250	Resistor	150Ω	1/16W	Base current limiting of boosting switching transistor
R251	Resistor	1KΩ	1/16W	Shunt resistance of boosting switching transistor
R252	Resistor	2KΩ	1/16W	Pull-up of RESET terminal of CPU
R253	Resistor	2KΩ	1/16W	Input voltage dividing resistance for Parallax Motor drive
R254	Resistor	3KΩ	1/16W	Input voltage dividing resistance for Parallax Motor drive
R255	Resistor	1KΩ	1/16W	Improvement of rise speed of DC/DC Converter
R256	Resistor	680KΩ	1/16W	Pull-up resistance of Y2 terminal of analog multiplexer (IC201)
R301	Resistor	6.8KΩ	1/16W	AF-IC oscillation
R302	Resistor	10KΩ	1/16W	Pull-up resistance of MODE terminal of AF-IC
R350	Resistor	100KΩ	1/16W	Adjustment of light metering output level of Light Metering IC
R351	Resistor	47KΩ	1/16W	Adjustment of light metering output level of Light Metering IC
R401	Resistor	62KΩ	1/16W	Stabilization of TTL Flash Auto control integration circuit
R402	Resistor	100Ω	1/16W	Current limiting of lens contact VDD terminal
D250	Diode	SM1XN04		Improvement of rise speed of DC/DC Converter
D350	Self-timer LED			Self-timer LED
D351	AF-assist beam LED			Emission of AF-assist beam
D352	Viewfinder LED			Back light LED for viewfinder display
D401	Diode	DC10F0 (W5)		Directing of TTL Flash Auto control signal in one direction
L250	Coil	LQH4N560K-04		Boosting choke coil
X'tal1	Oscillator			Main clock (8 MHz)
X'tal2	Oscillator			Sub clock (32 kHz)

FUNCTIONS OF SWITCHES

<External Operation Switches>



[1] Main Switch

This switch turns ON/OFF the power to the camera and switches AE Lock.

OFF	Main Switch OFF
↓↑	
ON	Main Switch ON
↓↑	
AEL	AE lock (Main Switch ON)

[2] Check Switch

When the Shutter Release Button is depressed halfway, this switch turns ON ("Hi" → "Low") so that the camera performs light metering, auto focusing and "parallax correction drive → lens drive".
- AF lock when the drive mode is SINGLE.
- Not AF lock when the drive mode is CONTINUOUS.

[3] Shutter Release Switch

When the Shutter Release Button is depressed fully, this switch turns OFF ("Hi" → "Low") so that the shutter operates.

[4] Exposure Compensation/Shutter Speed Dial Switch

This switch sets a shutter speed (Manual) or exposure compensation (Auto).

- Shutter speed setting
  1 second to 1/2000 second, B, X (14 steps)

- Exposure compensation setting
  - 2 to + 2 EV (1/3 EV step) (13 steps)

[5] A.B.C. Switch

0	A.B.C. setting OFF
↓↑	
0.5	Setting of A.B.C. operation of ± 0.5 EV
↓↑	
1	Setting of A.B.C. operation of ± 1.0 EV

[6] Focus Dial Switch

This switch detects a focus position.
The setting value of the Focus Dial is detected as voltage. (8-bit A/D conversion)

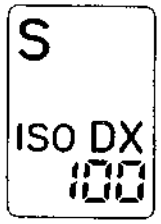
- Auto focusing ---------- "AF" mark
- Manual focusing ---------- "∞ ~ 0.5" (m) graduations

[7] ISO/DOWN Button Switch

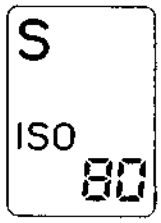
When the ISO Button is pressed, this switch turns ON ("Hi" → "Low"). Upon detecting "Low", the camera enters ISO check mode and the external LCD indicates the current film speed setting.

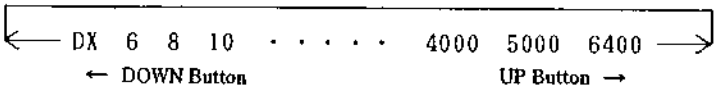
When the ISO Button is pressed in the ISO check mode for more than 1.2 seconds, the mode changes to ISO setting mode. In the ISO setting mode, the "ISO" display on the external LCD blinks. Also the ISO Button function changes to the DOWN Button function and the Drive Mode Selector Button function to the UP Button function.
While the UP Button or the DOWN Button is detecting "Low", the setting changes in the direction of UP or DOWN at the rate of 4 steps per second.

Auto Setting Mode



Manual Setting Mode

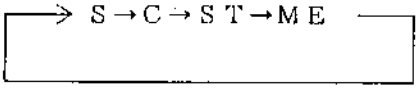




At an operation of a switch other than the UP/DOWN Buttons, the ISO setting mode is converted into the ISO/Drive Buttons restore their original functions.
At an operation of a switch other than the ISO Button, the ISO check mode is converted into original functions.

[8] Drive/UP Button Switch

When the Drive Button is pressed, this switch turns OFF ("Hi" → "Low"). At each detection of "Hi" → "Low", the switch changes drive mode to "single" (S), "continuous" (C), "self-timer" (ST) or "multiple exposure" (ME).



[9] Rewind Switch

This switch is used to start rewinding the film at mid-roll by pressing the Manual Rewind Button on the camera bottom.

- Rewinding starts when the Rewind Switch is turned ON with the Back Cover closed.
- With the Back Cover open, turn ON the Rewind Switch and within one second and turn ON the Shutter Release Switch, and the camera will enter manual adjusting mode about one second later.

<Internal Mechanical Switches>

[10] Charge Switch

The Charge Switches, incorporated in the S. Charge Ass'y, detect the timing of shutter charge control. There are two Charge Switches, namely, Charge Switch 1 and Charge Switch 2.

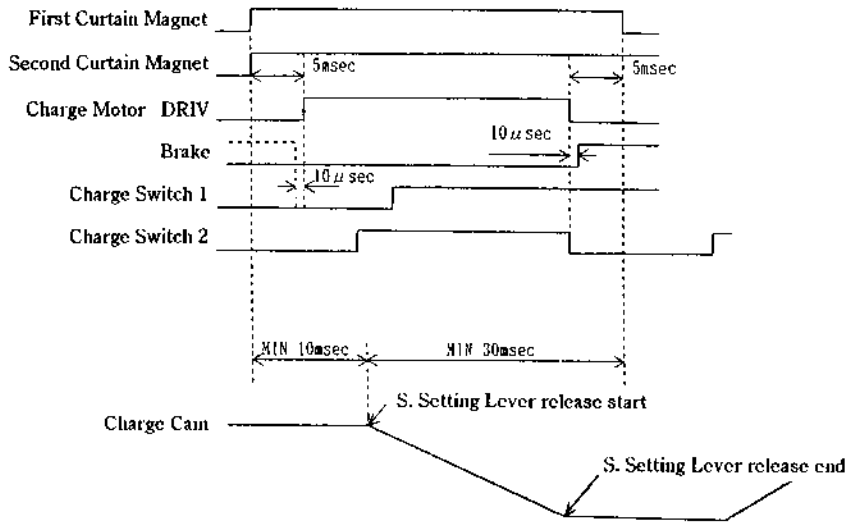
(Relationship between shutter charge release and Charge Switches)

① At "Check Switch ON → Shutter Release Switch ON", the Shutter Magnets are energized so that the First Curtain Magnet and the Second Curtain Magnet hold.

② The Shutter Charge Motor starts running five milliseconds after the holding by the First Curtain and Second Curtain Magnets.

③ After this starting (DRIV : "Hi", Brake : "Low"), the Shutter Charge Motor rotates the S. Cam Gear via the gear train, so that the cam moves the S. Setting Lever. At the same time, the contacts of the Charge Switch 1 and Charge Switch 2 caulked to the S. Gear (5) move round on the S. Control Board until the Charge Switch 2 turns "Low" → "Hi" and start releasing the S. Setting Lever. After that, the Charge Switch 1 turns "Low" → "Hi".

④ The Charge Switch 2 turns "Low" →"Hi" (charge release detection) 30 msec after its turning "Hi"→"Low". At this point, the Shutter Charge Motor stops (DRIV : "Low", Brake : "Low") and 10 μsec later, short braking occurs (DRIV : "Low", Brake : "Hi") to complete the releasing of the S. Setting Lever.



(Camera status vs. Charge Switches)

Camera Status	Charge Switch 1	Charge Switch 2
Release sequence start : (Charge release drive start)	"Low"	"Low"
↓	"Low"	"Low" →"Hi"
S. Setting Lever release start :	("Low")	("Hi")
↓	"Low" →"Hi"	"Hi"
(During S. Setting Lever release)	"Hi"	"Hi"
S. Setting Lever release completion :	("Hi")	("Hi")
S. Setting Lever release stop : (Charge release drive stop)	"Hi"	"Hi" → "Low"
Completion of S. Setting Lever release drive :	"Hi"	"Low"

(Relationship between shutter charge and Charge Switches)

① The Shutter Charge Motor is released from the brake (DRIV : "Low", Brake : "Low") 30 msec after the completion of shutter sequence (Second Curtain Magnet OFF).

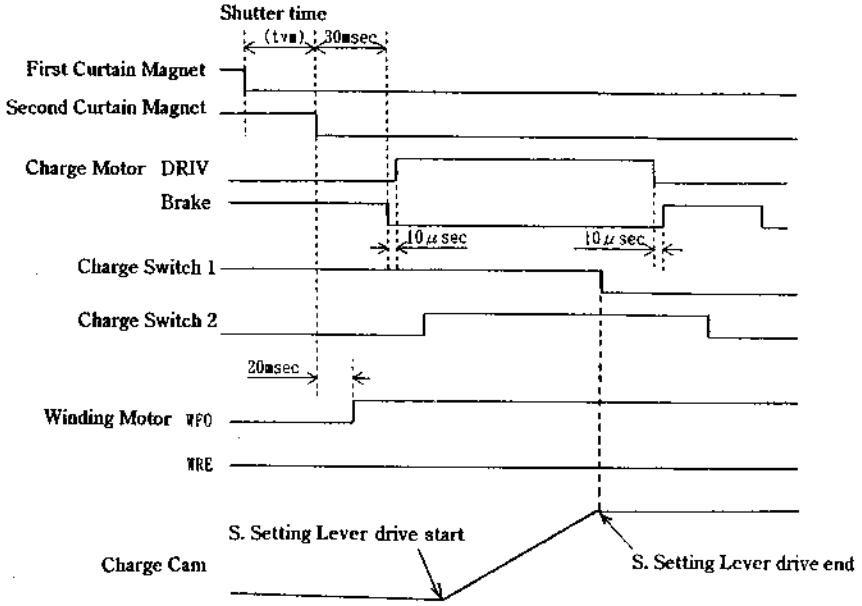
② Charge drive starts (DRIV : "Hi", Brake : "Low") 10 μsec later. Ten milliseconds after the start of winding drive, the Shutter Charge Motor rotates the S. Cam via the gear train to move the S. Setting Lever. The S. Setting Lever, which is in contact with the Setting Lever of the Shutter Unit, charges the Shutter Unit.

③ As the S. Cam Gear rotates, the contacts of the Charge Switches caulked to the S. Gear (5) move round on the S. Control Board. As a result, the Charge Switch 2 turns "Low" → "Hi" and starts setting the S. Setting Lever.

④ After that, the Charge Switch 1 turns "Hi" → "Low" to complete the setting of the Shutter Unit.

⑤ After the completion of the Shutter Unit (Charge Switch 1 : "Low", Charge Switch 2 : "Hi"), the Shutter Charge Motor stops (DRIV : "Low", Brake : "Low") and 10 μsec later, the brake operates (DRIV : "Low", Brake : "Hi").

⑥ At step ⑤, charge drive is completed when the Charge Switch 1 and Charge Switch 2 both turn "Low" during the motor overrun.
When the Charge Switch 1 or Charge Switch 2 does not turn "Low" during braking, the motor is driven by pulse until the Charge Switch 1 and Charge Switch 2 both turn "Low".



(Camera status vs. Charge Switches)

Camera Status	Charge Switch 1	Charge Switch 2
Shutter charge drive start :	"Hi"	"Low"
↓	"Hi"	"Low" → "Hi"
S. Setting Lever drive start :	"Hi"	"Hi"
(During shutter charge)	("Hi")	("Hi")
↓	"Hi" → "Low"	"Hi"
S. Setting Lever drive stop :	"Low"	"Hi" → "Low"
Shutter sequence completion :	"Low"	"Low"
(Shutter charge drive completion)		

[11] Back Cover Switch

This switch detects the opening and closing of the Back Cover.

- The Back Cover Switch turns OFF → ON ("Hi" → "Low") at the "closing → opening" of the Back Cover.
- At the "opening → closing" of the Back Cover, the switch turns ON → OFF ("Low" → "Hi") and starts blank shots advance of the film.

[12] Lens Lock Switch

The switch at the lens mount (Spigot turning) on the Body detects the mounting of a lens on the Body.
Mount a lens on the Body Mount and turn the Mounting Ring of the Lens, and the Lens Lock Switch will turn ON → OFF.

- Lens has been mounted : OFF ("Hi")
- Lens has not been mounted : ON ("Low")

[13] Parallax Correction Detecting Switch

The Parallax Correction Detecting Switch, installed at the bottom of the Finder Unit Ass'y, detects the reference position of the cam by means of the PC board stuck on the Parallax Correction Gear (3). The optical infinity is positioned at eight pulses counted from the "ON → OFF" of this switch. That is, this switch provides the reference point for counting.
The CPU calculates the number of parallax correction pulses based on the AF distance data (Focus Dial position in manual focusing) and the focal length of the mounted lens.
The pulse motor is controlled according to the number of the drive pulses that are determined from the current correction position and the calculated correction value.

<Meaning of parallax correction>
Since the viewfinder optical system in this camera is independent of the exposure optical system, parallax occurs between the viewfinder screen and the exposed screen according to the shooting distance. The camera puts a mask on the viewfinder screen so that the viewfinder screen becomes the same as the exposed screen. This operation is called "parallax correction".
The mask, a mechanical part, is driven by the pulse motor via a cam so that it moves by a required travel.
The mechanism is so designed that the exposed screen agrees with the viewfinder screen at the shooting distance of infinity. Accordingly, the shorter the shooting distance, the larger the parallax.
Also the parallax is larger for the mounted lens with a smaller picture area (with a greater focal length).

[14] Lens Contacts (Lens Signal Pin)

These contacts (× 5) send lens information to the camera body when a lens has been mounted on the Body Mount.

① Grounding terminal
② Power supply (VDD) terminal
③ Lens model terminal -------The lens divides the VDD-GND voltage supplied by the Body and outputs the divided voltage to inform the CPU of the lens model mounted on the Body.
④ Infinity position adjustment terminal ------This terminal outputs the adjustment of the infinity position as voltage. This voltage is A/D converted for use as the infinity adjusted value.
⑤ Start position code terminal ----The switch for detecting the reference position of the lens. For lens drive. Position Detecting Pattern Switch ON ←→ OFF ("Low" ←→"Hi")

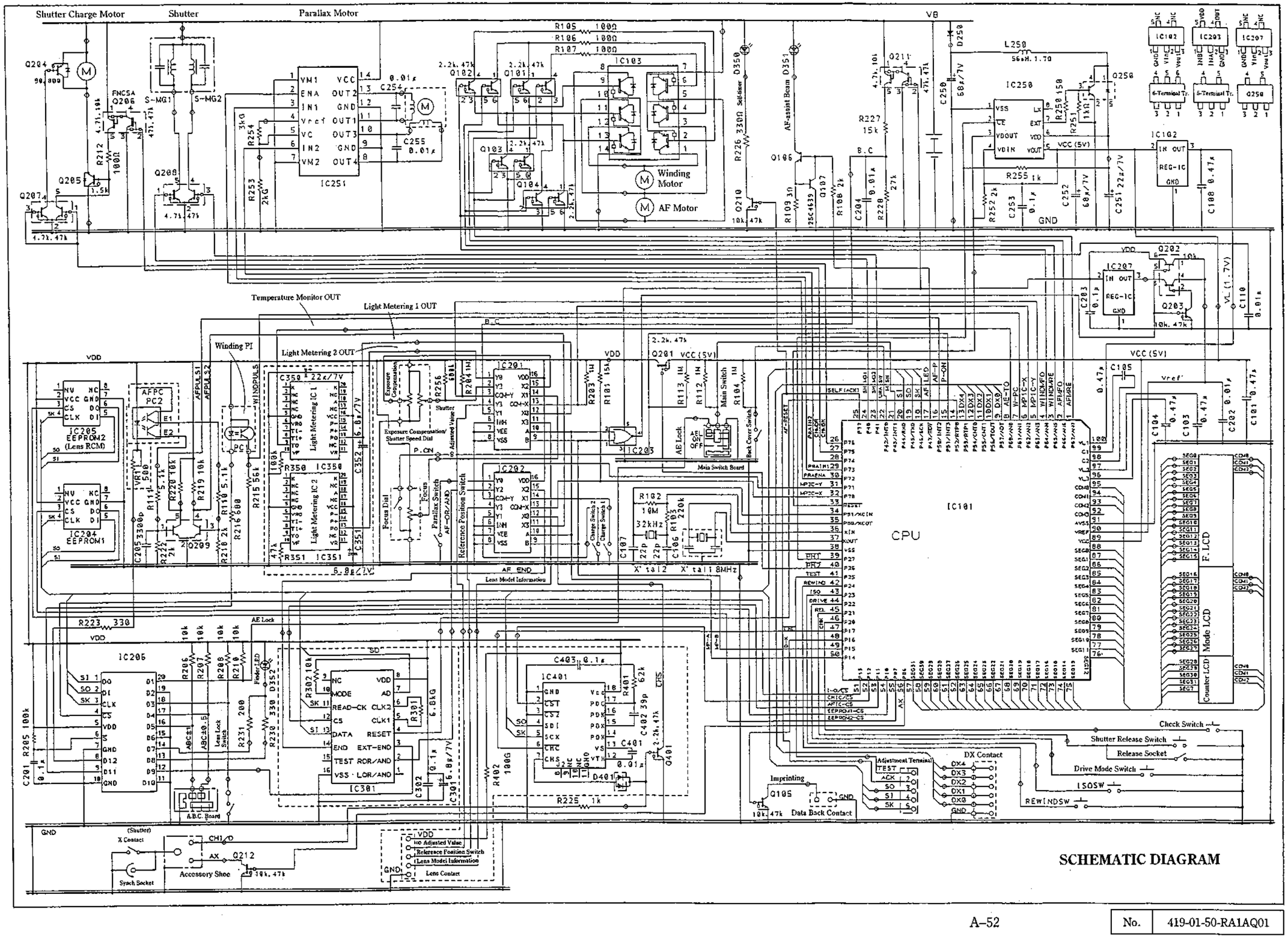
[15] DX Switch

① This switch detects the DX code of the film cartridge and automatically sets a film speed according to the DX code.

Setting range : ISO 25 to 5000 in 1/3 SV steps

② Detection timing

100 msec after the detection of "Back Cover open → close"



SCHEMATIC DIAGRAM

No.	419-01-50-RA1AQ01

B. DISASSEMBLY & REASSEMBLY PROCEDURES

B-1. REMOVAL OF EXTERIOR PARTS

[Chart for Removal of Exterior Parts]

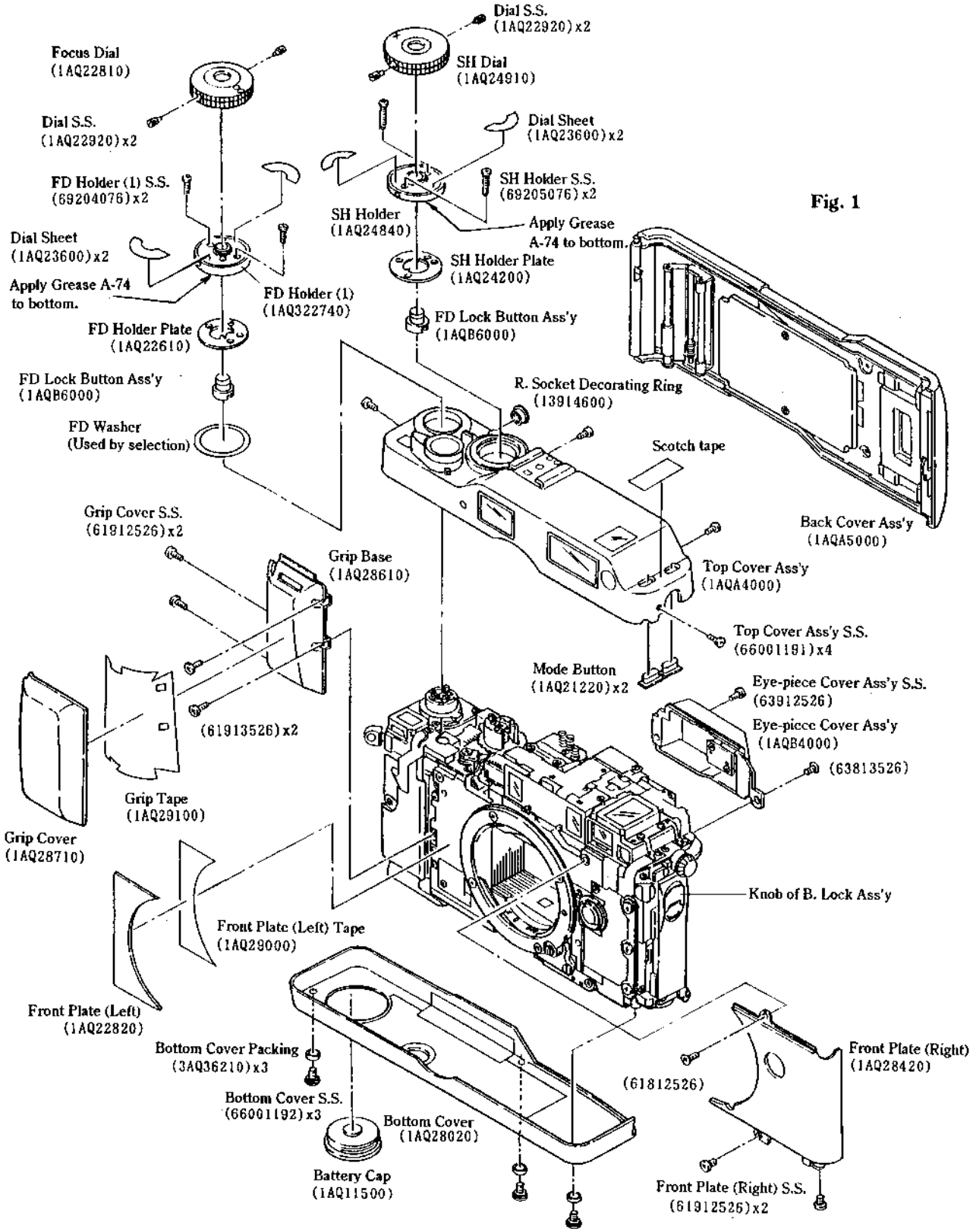


Fig. 1

B-1-1. Removal of Back Cover Ass'y

(See Fig. 1)

1) Open the Back Cover Ass'y (1AQA5000) by turning the knob of the B. Lock Ass'y in the direction of the arrow.
2) Remove the Back Cover Ass'y while pushing down the Back Cover Release Pin.

B-1-2. Removal of Bottom Cover

(See Fig. 1)

1) Remove the Battery Cap (1AQ11500) by turning it and take out the Batteries (CR2)×2.
2) Remove the Bottom Cover Setscrews (66001192)×3 and the Bottom Cover Packings (3AQ36210)×3 and take off the Bottom Cover (1AQ28020).

B-1-3. Removal of Top Cover Ass'y

(See Fig. 1)

1) Turn the Focus Dial and position its "∞" mark at the Dial Index.
2) Remove the Dial Setscrews (1AQ22920)×2 and take off the Focus Dial (1AQ22810).
3) Remove the FD Holder (1) Setscrews (69204076)×2 and take off the FD Holder (1) (1AQ22740) W/Dial Sheet (1AQ23600)×2, FD Holder Plate (1AQ22610) and FD Lock Button Ass'y (1AQB6000).
4) Turn the SH Dial and position its "X" mark at the Dial Index.
5) Remove the Dial Setscrews (1AQ22920)×2 and take off the SH Dial (1AQ24910).
6) Remove the SH Holder Setscrews (69205076)×2 and take off the SH Holder (1AQ24840) W/Dial Sheet (1AQ23600)×2, SH Holder Plate (1AQ24200) and FD Lock Button Ass'y (1AQB6000).
7) Remove the R. Socket Decorating Ring (13914600).
8) Stick the Scotch tape on the Mode Buttons (1AQ21220)×2, remove the Top Cover Ass'y Setscrews (66001191)×4 and take off the Top Cover Ass'y (1AQA4000).

Notes: a) Each Dial Sheet (1AQ23600) is fixed to the FD Holder and SH Holder with double-stick tape. In repair, there is no need of removing the Dial Sheet.

b) The Top Cover Setscrew (66001191) (thread length: 3.0 mm) is used in the production line. However, remember that the Top Cover Ass'y Setscrew (66001193) (thread length: 3.5 mm) is used to cope with a faulty screw hole.

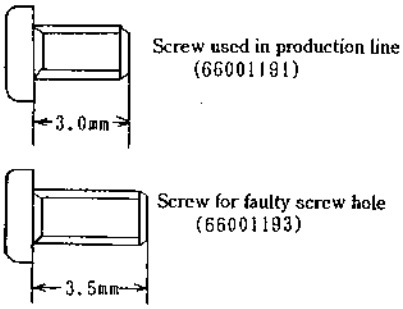


Fig. 2

B-1-4. Removal of Other Exterior Parts

(See Fig. 1)

1) Peel off the Grip Cover (1AQ28710).
2) Peel off the Front Plate (Left) (1AQ22810).

Notes: a) The Grip Cover is fixed to the Grip Base (1AQ28610) with the Grip Tape (1AQ29100).

b) The Front Plate (Left) is fixed to the Body with the Front Plate (Left) Tape (1AQ29000).

c) Once the Grip Cover and the Front Plate (Left) are peeled off, the adhesive strength of the Grip Tape and Front Plate (Left) Tape weakens. Be sure to replace the Grip Tape and the Front Plate (Left) Tape with new ones.

3) Remove the Grip Base Setscrews (61913526)×2, (61912526)×2 and take off the Grip Base (1AQ28610).
4) Remove the Front Plate (Right) Setscrews (61912526)×2, (61812526) and take off the Front Plate (Right) (1AQ28420).
5) Remove the Eye-piece Cover Ass'y Setscrews (63813526), (63912526) and take off the Eye-piece Cover Ass'y (1AQB4000).

[Notes on Handling of Removed Top Cover Ass'y]

a) Take care not to bend or deform the Main Switch contacts or ABC contacts that are incorporated in the Top Cover Ass'y.

b) Take care not to leave your fingerprints on the window glasses of the Top Cover Ass'y, the lenses of the Finder Unit Ass'y, Counter LCD or Mode LCD. Also take care not to flaw them.

[How to Check Shutter Operation with Top Cover Ass'y Removed]

*** To operate the camera with the Top Cover Ass'y removed, cause a short circuit on the pattern as shown in Fig. 3 by a bridge with solder.**

*** After completion of the operation check, remove the solder.**

[Notes on Installation of Top Cover Ass'y]

*** Pay attention to the following instructions before starting to install the Top Cover Ass'y and during the installation.**

a) Make certain that the External Light Metering Filter (1AQ87800) has not been removed.

b) Install the Top Cover Ass'y while taking care not to catch the Green and Orange lead wires on the right side of the Body, and not to catch the Main FPC.

c) Install the Top Cover Ass'y while taking care not to catch the AF M. Mask (1) (1AQ89000).

d) Install the Top Cover Ass'y while taking care not to catch the Main FPC at the Counter LCD.

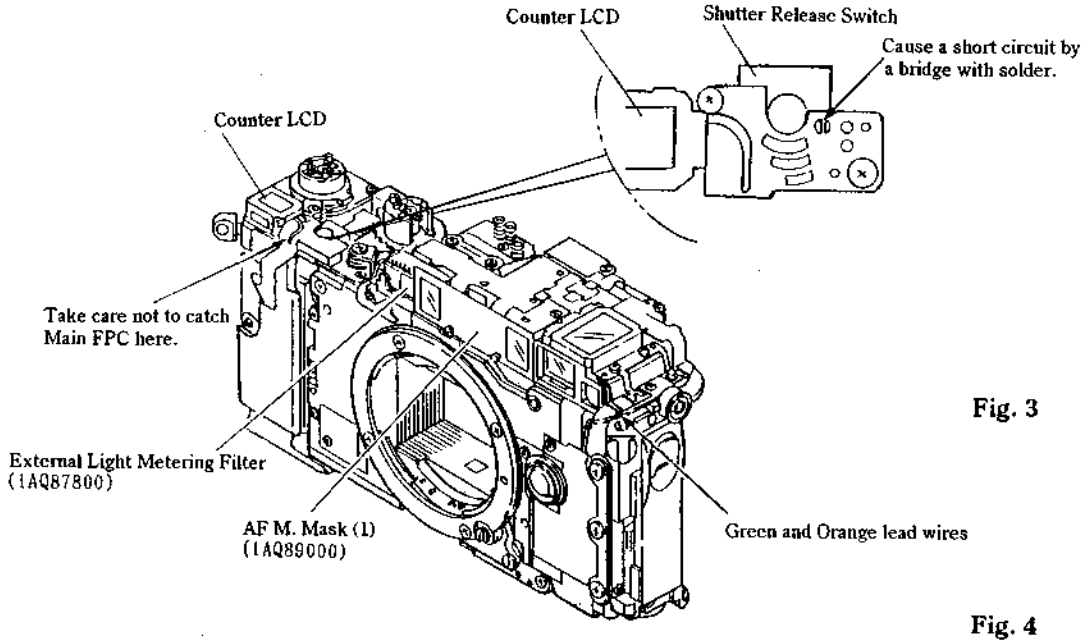
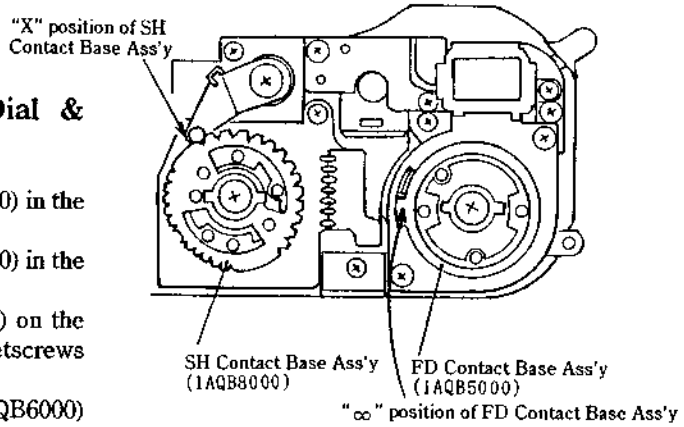

Counter LCD
Shutter Release Switch
Cause a short circuit by a bridge with solder.
Counter LCD
Take care not to catch Main FPC here.
External Light Metering Filter (1AQ87800)
AF M. Mask (1) (1AQ89000)
Green and Orange lead wires

Fig. 3

Fig. 4


"X" position of SH Contact Base Ass'y
SH Contact Base Ass'y (1AQB8000)
FD Contact Base Ass'y (1AQB5000)
"∞" position of FD Contact Base Ass'y

[Installation Procedure for SH Dial & Focus Dial]

1) Set the SH Contact Base Ass'y (1AQB8000) in the position as shown in Fig. 4.
2) Set the FD Contact Base Ass'y (1AQB5000) in the position as shown in Fig. 4.
3) Install the Top Cover Ass'y (1AQA4OOO) on the Body and tighten the Top Cover Ass'y Setscrews (66001191)×4.
4) Install the FD Lock Button Ass'y (1AQB6000) with its projection toward the rear of the Body. Then install the SH Holder plate (1AQ24200) as shown in Fig.5.
5) Install the SH Holder (1AQ24840) so that its "SH" mark is positioned at the Dial Index, and tighten the SH Holder Setscrews (69205076)×2. Stick the Dial Sheet (1AQ23600)×2 on the SH Holder.
6) Install the SH Dial (1AQ24910) so that its "X" mark is positioned at the Dial Index , and tighten the Dial Setscrews (1AQ22920)×2.
7) Turn the SH Dial and make certain that it is locked in the "AUTO" position.

8) Install the FD Lock Button Ass'y (1AQB6000) with its projection toward the front of the Body. Then install the FD Holder Plate (1AQ22600) as shown in Fig. 5.
9) Install the FD Holder (1) (1AQ22740) as shown in Fig. 5 and tighten the FD Holder (1) Setscrews (69204076)×2. Stick the Dial Sheet (1AQ23600)×2 on the FD Holder.
10) Install the Focus Dial (1AQ22810) so that its "∞ " mark is positioned at the Dial Index , and tighten the Dial Setscrews (1AQ22920)×2.
11) Turn the Focus Dial and make certain that it is locked in the "AF" position.

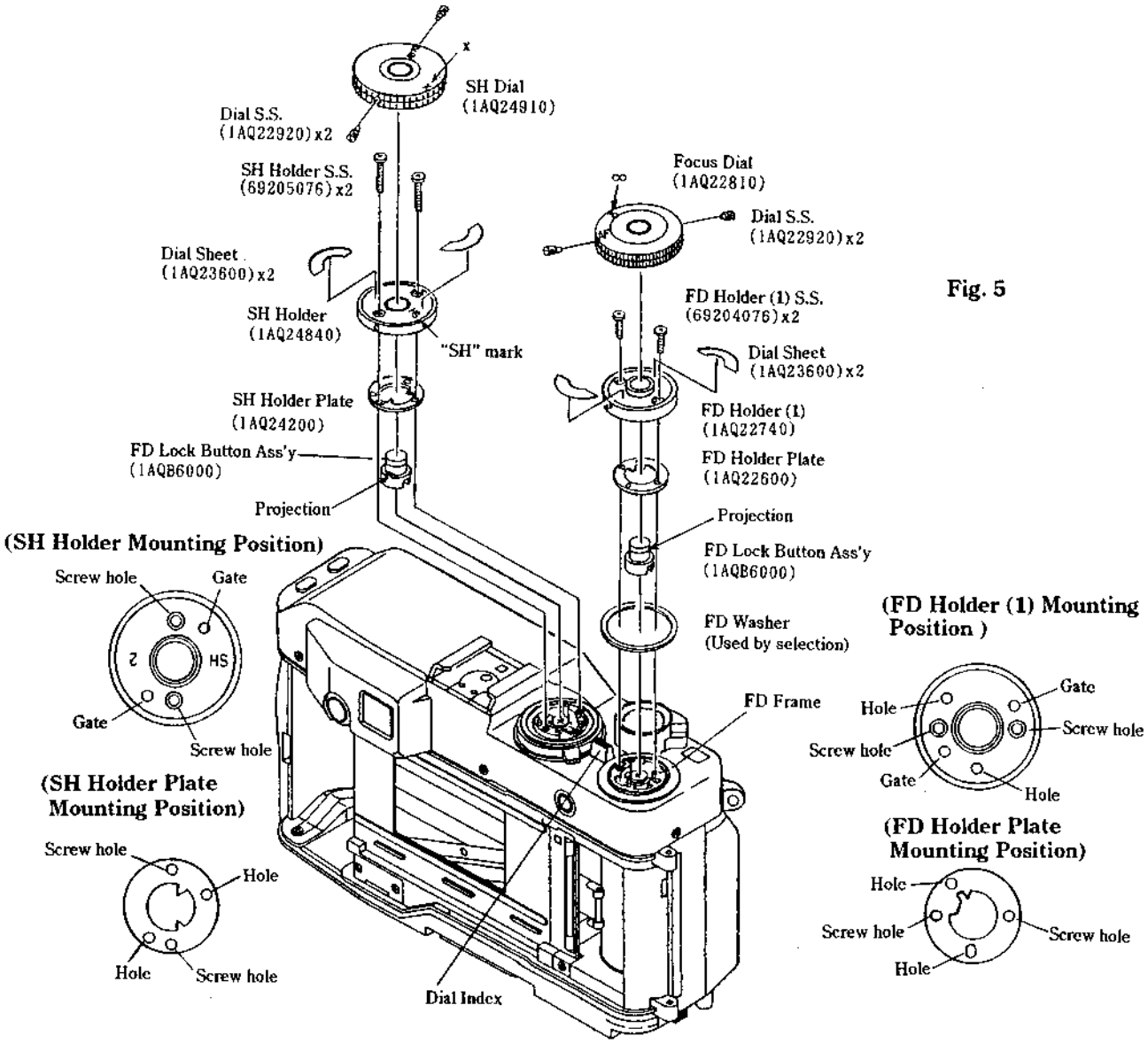


Fig. 5

[Adjustment Procedure for Focus Dial Lateral Play]

1) Before securing the FD Holder (1) (1AQ22740) with the screws, depress the FD Holder (1) and check the gap between the FD Frame (Top Cover) and the FD Holder (1).
2) Select an appropriate FD Washer (t: 0.05, 0.07, 0.1, 0.2) for the gap and install it.

Part Name	Part No.	Thickness
FD Washer 05	1AQ29500	t: 0.05
FD Washer 07	1AQ29600	t: 0.07
FD Washer 10	1AQ29700	t: 0.1
FD Washer 20	1AQ29800	t: 0.2

3) Tighten the FD Holder (1) Setscrews (69204076)×2.
4) While turning the FD Holder (1), check the lateral play of the FD Holder (1) and uneven turning.

- If the lateral play of FD Holder (1) is significant : Replace the FD Washer with a thicker one or add another FD Washer.
- If unevenness in the FD Holder (1) turning is significant : Replace the FD Washer with a thinner one or remove an FD Washer.

5) Install the Focus Dial (1AQ22810) and tighten the Dial Setscrews (1AQ22920)×2.
6) Turn the Focus Dial again to check the operation.

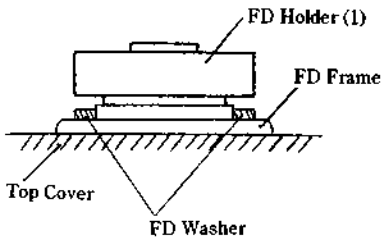


Fig. 6

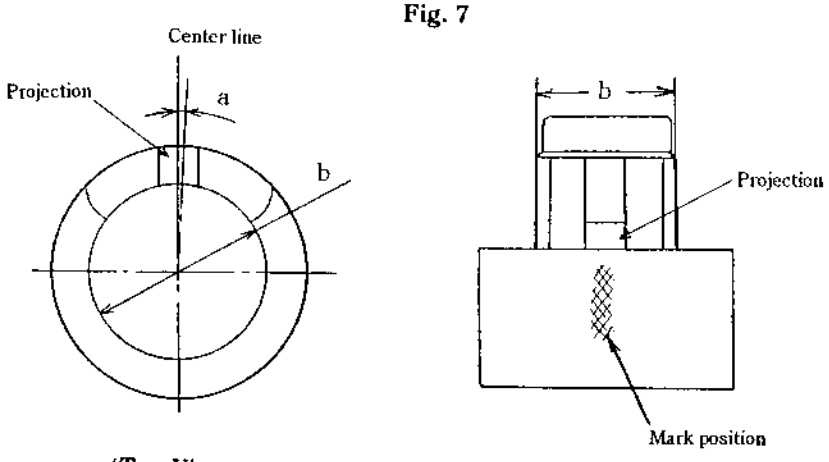
[Selection of FD Lock Button Ass'y]

There are three types of FD Lock Button Ass'y to cope with the play of the FD Lock Button Ass'y and the faulty locking of the Focus Dial or SH Dial.
The FD Lock Button Assemblies come with the respective markings and the following specifications.

Marking	a	b	Applicable Dial	Ordering Part Name
None	1° 30′	φ4.96	(SH Dial)	FD Lock Button Ass'y
Red	1°	φ4.99	Focus Dial (SH Dial)	FD Lock Button Ass'y (R)
Black	30′	φ5.0 0 -0.03	Focus Dial SH Dial	FD Lock Button Ass'y (B)

Notes: a) Use by selection for ( ).
b) As the permanent measure, use the Red or Black one for the Focus Dial and the Black one for the SH Dial.

Fig. 7



(Top View)

[Correction of Level Difference between Top Cover Ass'y and Front Plate]

Note that the following measures have been taken in the production line to correct the level difference, if any, between the Top Cover Ass'y and the Front Plates.

① To correct the level difference at Ⓐ, a 0.3 mm washer has been fixed at the screw Ⓑ to the Front Plate (Right) with the bond (Cemedine 551).
② To correct the level difference at Ⓒ, two pieces of the Front Plate (Left) Tape (1AQ29000) have been attached by putting one upon the other.

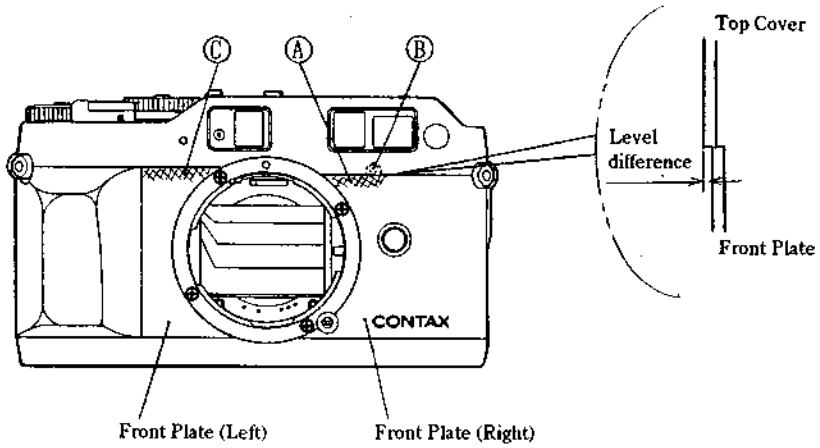
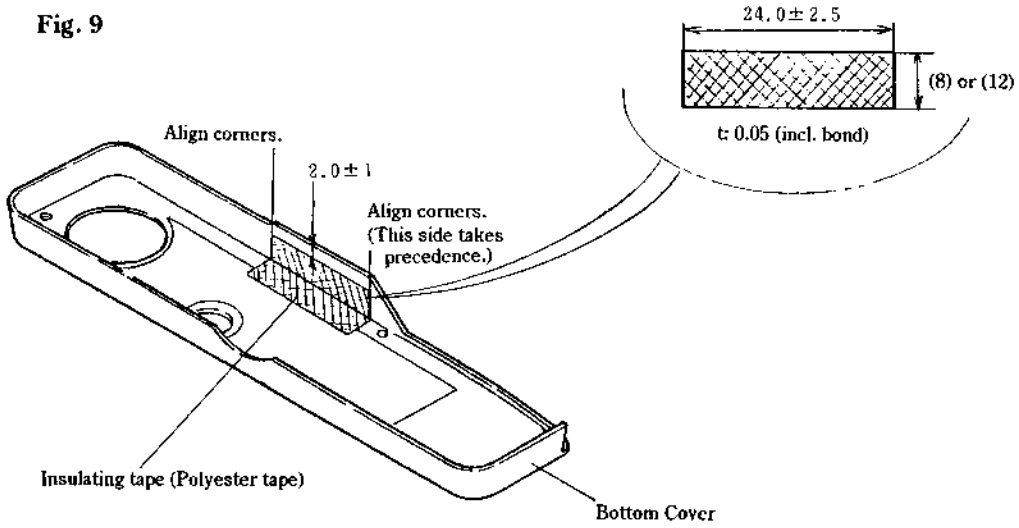


Fig. 8

[Sticking of Bottom Cover Insulating Tape]

Insulating tape (Sekisui Polyester Tape #33) has been stuck to prevent a short circuit from occurring between the FPC connecting portion of the Main FPC and TTL Flash Auto W/L. Contact FPC and the Bottom Cover. When the Bottom Cover is replaced, peel off the insulating tape and use it again.

Fig. 9



B-2. REMOVAL OF MAIN FPC ASS'Y

[Chart for Removal of Lead Wires on Main FPC Ass'y]

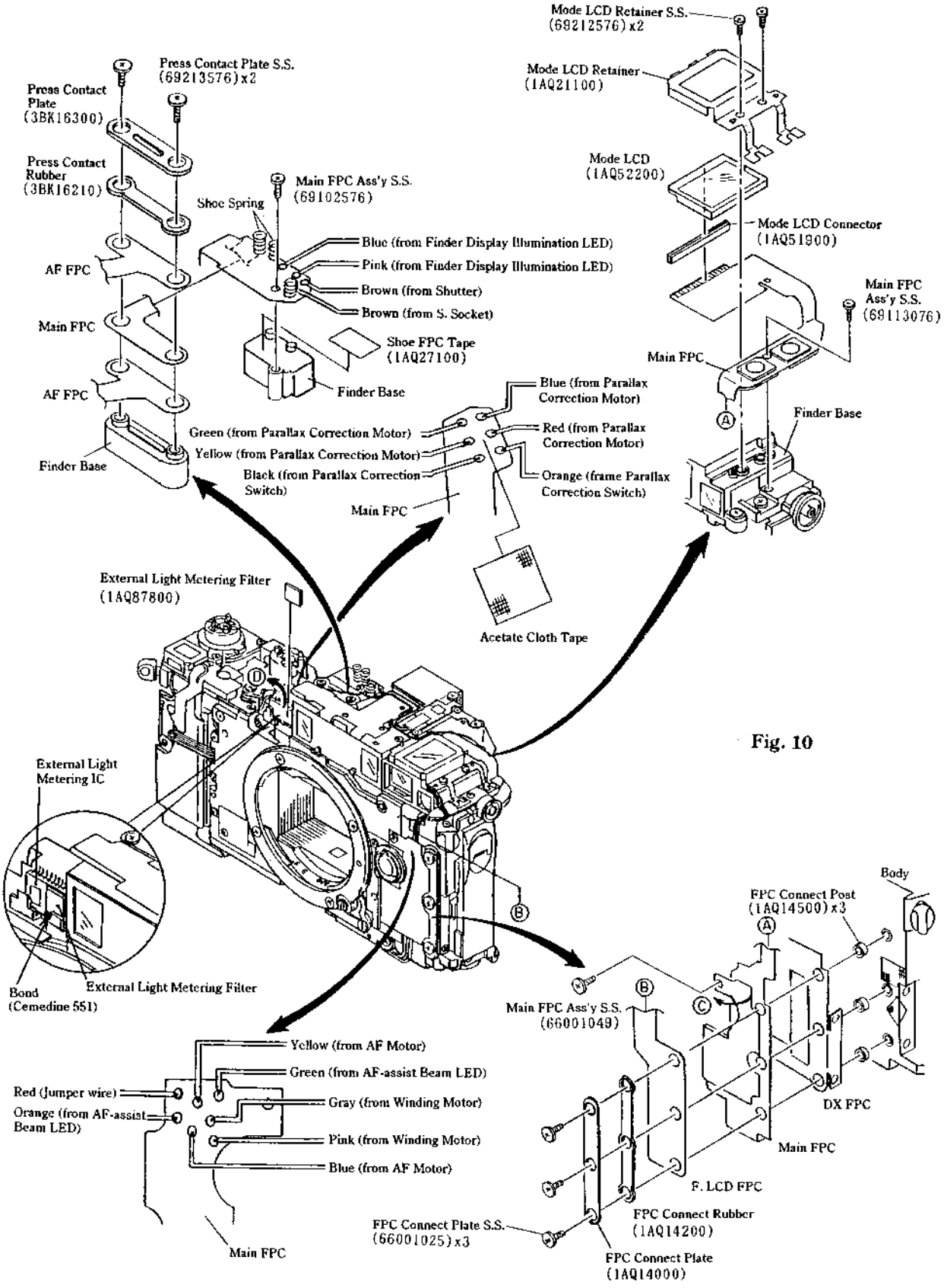


Fig. 10

B-2-1. Removal of Finder Unit Ass'y

(Top Right of Body) (See Fig. 10)

1) Remove the Mode LCD Retainer Setscrews (69212576)×2 and take off the Mode LCD Retainer (1AQ21100), Mode LCD (1AQ52200) and Mode LCD Connector (1AQ51900).
2) Remove the Main FPC Ass'y Setscrew (69113076).

(Front Right of Body)

3) Remove the Main FPC Ass'y Setscrew (66001049).
4) Raise the Main FPC in the direction of the arrow Ⓒ and unsolder the Orange and Green lead wires (from AF-assist Beam LED).
5) Remove the FPC Connect Plate Setscrews (66001025)×3 and take off the FPC Connect Plate (1AQ14000), FPC Connect Rubber (1AQ14200) and FPC Connect Post (1AQ14500)×3.

(Top of Body)

6) Unsolder the Blue and Pink lead wires (from Viewfinder Display Illumination LCD).
7) Unsolder the Brown lead wire (from Shutter) and the Brown lead wire (from S. Socket).
8) Unsolder the Blue, Green, Yellow and Red lead wires (from Parallax Correction Motor Ass'y).
9) Unsolder the Black and Orange lead wires (from Parallax Correction Switch).
10) Remove the Main FPC Ass'y Setscrew (69102576).
11) Remove the Press Contact Plate Setscrews (69213576)×2 and take off the Press Contact Plate (3BK16300) and the Press Contact Rubber (3BK16210).

(Top Front of Body)

Notes: The Main FPC is fixed to the Finder Base with the Shoe FPC Tape (1AQ27100) to ensure the reliable grounding of the Shoe Spring. Accordingly, take due care when removing the Main FPC Ass'y.

12) Remove the External Light Metering Filter (1AQ87800).

Notes: a) The External Light Metering Filter is fixed to the Finder Base with the bond (Cemedine 551).
b) Take care not to leave your fingerprints on the External Light Metering Filter. Also take care not to flaw it.

13) Remove the External Light Metering IC portion from the Finder Base in the direction of the arrow Ⓓ. (See Fig. 10)
14) Remove the AF Module Ass'y Setscrews (69113076)×2 and take off the AF Module Ass'y (1AQE7000). (See Fig. 11)
15) Remove the Finder Unit Ass'y Setscrews (63913526)×2 and take off the Finder Unit Ass'y (1AQF1000). (See Fig. 11).

[Notes on Handling of FPC Connect Pattern]

a) Do not touch the connect patterns of the Mode LCD Connector and Main FPC Ass'y directly with a bare hand.
Clean the connect patterns of the Mode LCD and Main FPC Ass'y with lens cleaning paper with ether alcohol.

b) Do not touch the connect patterns of the F. FPC, Main FPC Ass'y and DX FPC directly with a bare hand.
Clean the connect patterns of the F. FPC, Main FPC Ass'y and DX FPC with lens cleaning paper with ether alcohol.

c) Do not touch the connect patterns of the AF. FPC and Main FPC Ass'y directly with a bare hand.
Clean the connect patterns of the AF. FPC and Main FPC Ass'y with lens cleaning paper with ether alcohol.

[Notes on Handling of AF Module Ass'y]

a) Do not disassemble the AF Module Ass'y; its disassembly can cause faulty auto focusing.
At the occurrence of faulty auto focusing, replace the AF Module Ass'y (1AQE7000) with a new one.

[Chart for Removal of Finder Unit Ass'y]

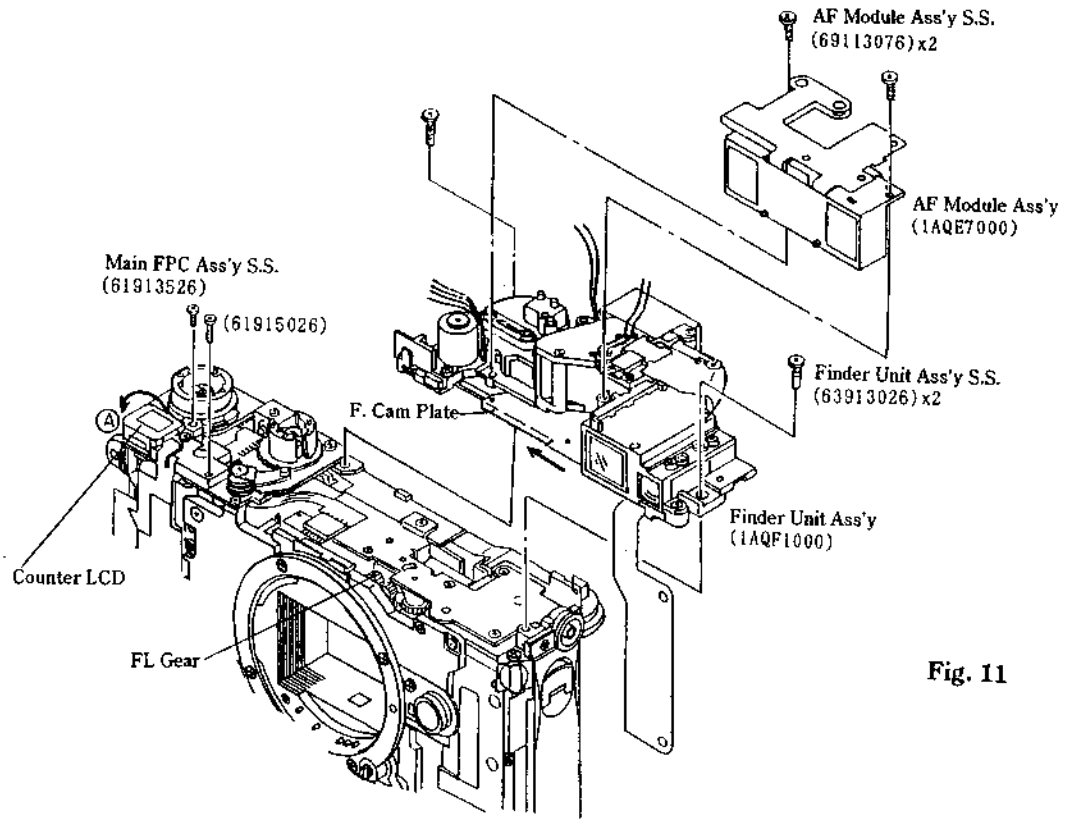


Fig. 11

[Notes on Handling of Finder Unit Ass'y]

a) Do not disassemble the optical system in the Finder Unit Ass'y; its disassembly can cause faulty parallax or incorrect AF target position.
b) Do not remove the Finder Cover; otherwise, dust can easily enter the Finder Unit. However, the Finder Cover (2) Ass'y (1AQF9000) can be replaced. When replacing it, take care that dust does not enter the Finder Unit.
Also take due care when removing the Finder Cover (2) Ass'y, since the Finder FPC Ⓑ can be easily broken.
c) Take care not to leave your fingerprints on the glass or lens. Also take care not to flaw them.

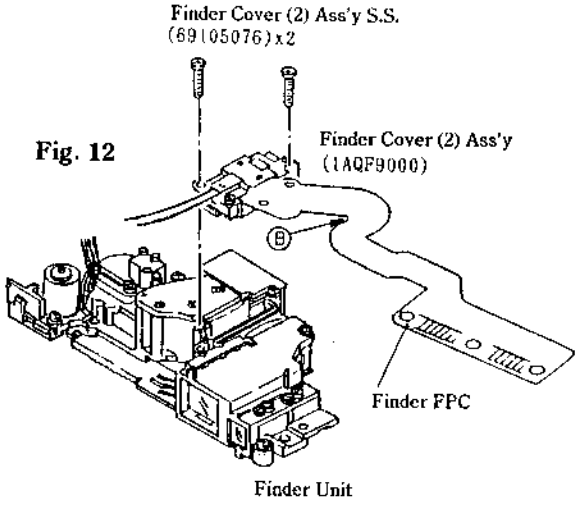


Fig. 12

[Notes on Installation of Finder Unit Ass'y]

a) With the F. Cam Plate moved fully in the direction of the arrow (Wide side), install the Finder Unit Ass'y on the Body. (See Fig. 11)
After installation, hold the F. Cam Plate with tweezers and move it right and left to check for play.
If there is no play of the F. Cam Plate, change the engagement between the rack of the F. Cam Plate and the FL Gear by one tooth and install the Finder Unit Ass'y again.
Once the Finder Unit Ass'y is removed, check the field of view of the viewfinder. (See page C-2.)

[Chart for Removal of Main FPC Ass'y]

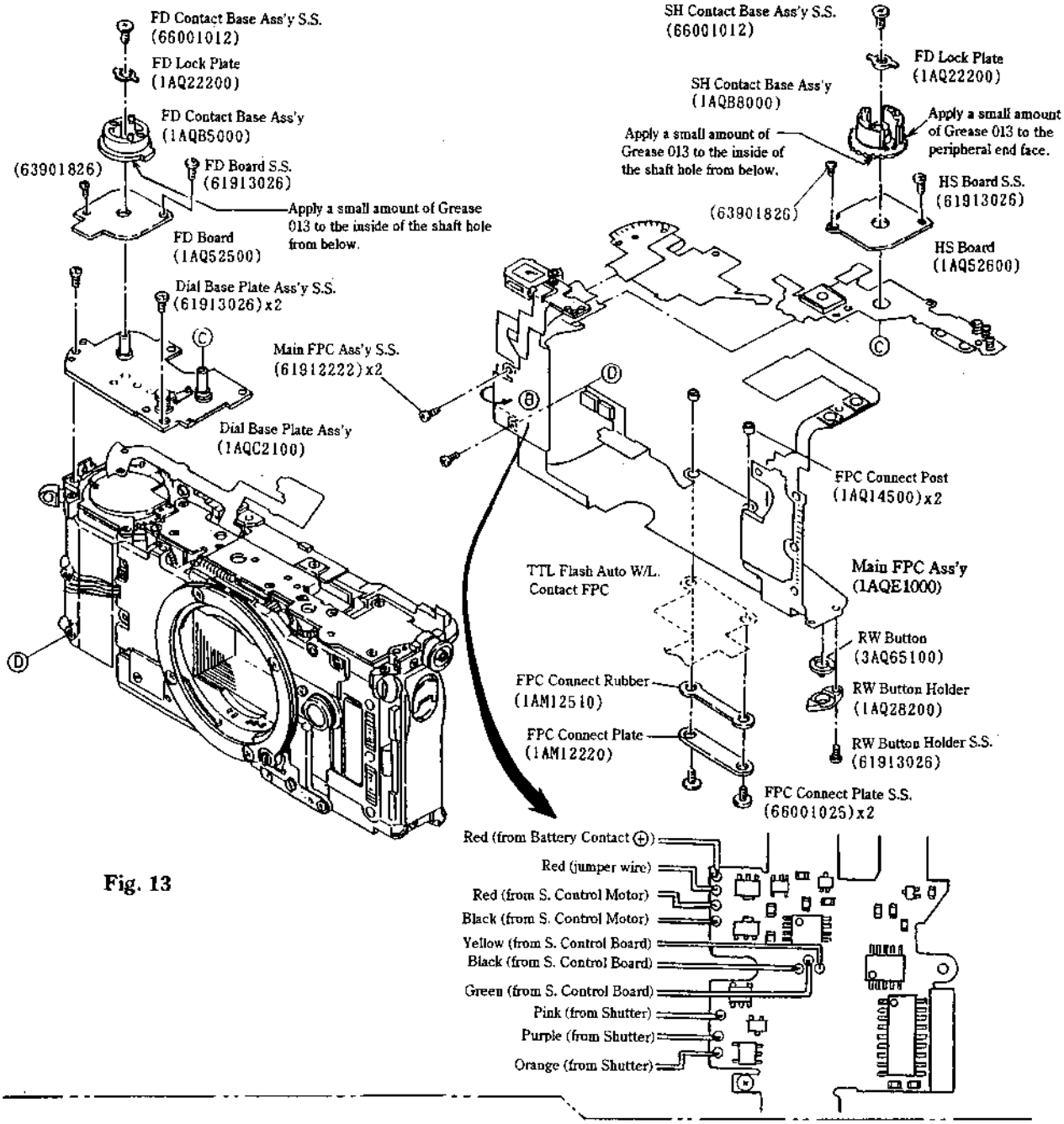


Fig. 13

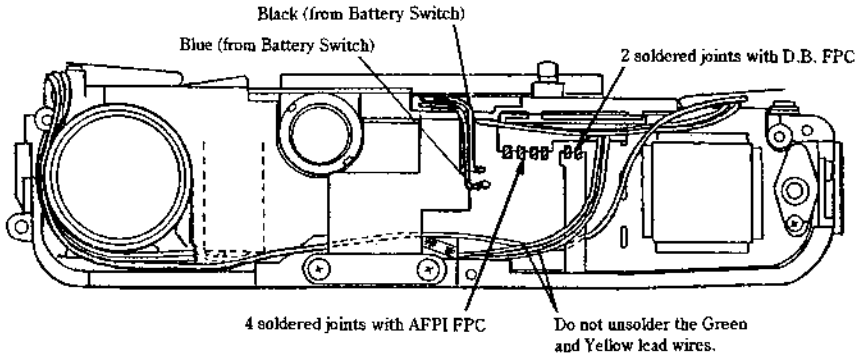

Black (from Battery Switch)
Blue (from Battery Switch)
2 soldered joints with D.B. FPC
4 soldered joints with AFPI FPC
Do not unsolder the Green and Yellow lead wires.

Fig. 14

B-2-2. Removal of Main FPC Ass'y

(Top of Body) (See Fig. 11)

1) Remove the Main FPC Ass'y Setscrews (61915026), (61914026) and raise the Counter LCD portion in the direction of the arrow Ⓐ.

(See Fig. 15)

2) Unsolder the 7 soldered joints between the HS Board and the Main FPC.
3) Unsolder the 4 soldered joints between the FD Board and the Main FPC.
4) Unsolder the Green lead wire (from R. Socket).

(See Fig. 13)

5) Remove the SH Contact Base Ass'y Setscrew (66001012) and take off the FD Lock Plate (1AQ22200) and SH Contact Base Ass'y (1AQB8000).
6) Remove the FD Contact Base Ass'y Setscrew (66001012) and take off the FD Lock Plate (1AQ22200) and FD Contact Base Ass'y (1AQB5000).

Note: Take care not to bend or deform the contacts of the SH Contact Base Ass'y or FD Contact Base Ass'y.

(See Fig. 13)

7) Remove the HS Board Setscrews (63913026), (63901826) and take off the HS Board (1AQ52600).
8) Remove the FD Board Setscrews (63913026), (63901826) and take off the FD Board (1AQ52500).
9) Remove the Dial Base Plate Setscrews (61913026)×2 and take off the Dial Base Plate Ass'y (1AQC2100).

(See Fig. 16)

10) Unsolder the 3 soldered joints between the WPI FPC and the Main FPC.
11) Unsolder the 7 soldered joints between the AE FPC and the Main FPC.
12) Remove the Main FPC Ass'y Setscrew (66001012).
13) Raise the Main FPC in the direction of the arrow Ⓑ.

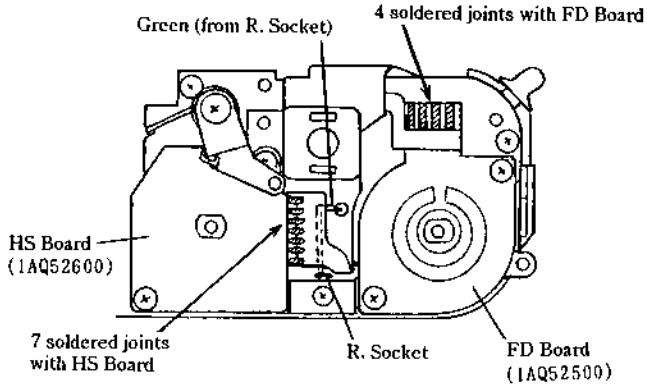
(See Fig. 17)

14) Unsolder the Red lead wire (from Diode).

(Front Right of Body) (See Fig. 10)

15) Unsolder the Yellow and Blue lead wires (from AF Motor).
16) Unsolder the Pink and Gray lead wires (from Winding Motor).
17) Unsolder the Red lead wire (jumper wire for positive power).

Fig. 15



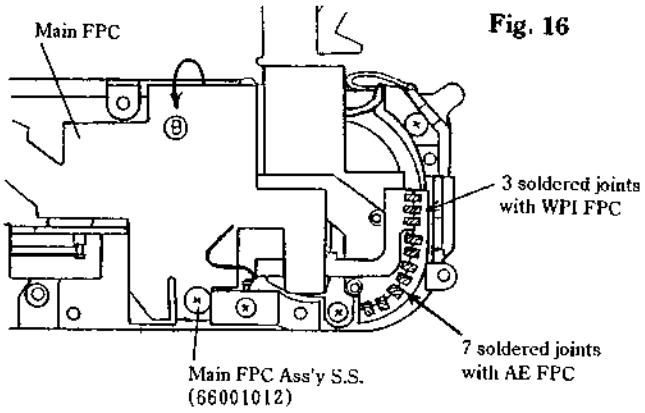


Fig. 16

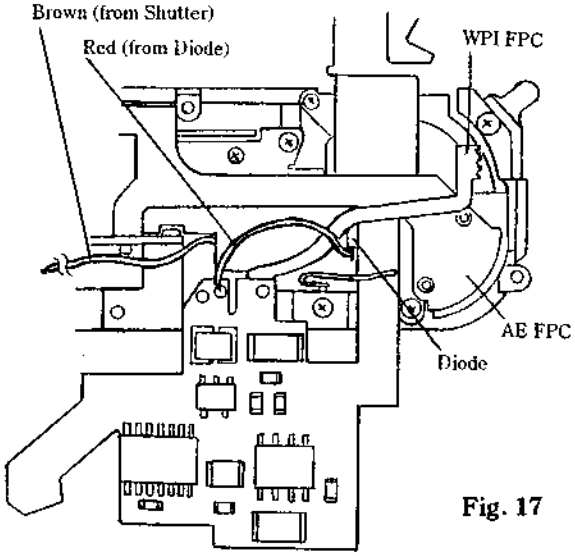


Fig. 17

(Front Left of Body) (See Fig. 13)

18) Remove the Main FPC Ass'y Setscrew (61912222) and raise the Main FPC in the direction of the arrow Ⓑ.
19) Unsolder the other Red lead wire (from Battery Contact ⊕).

Note: Do not unsolder the other Red lead wire (jumper wire for positive power).

20) Unsolder the Black and Red lead wires (from S. Control Motor).
21) Unsolder the Yellow, Black and Green lead wires (from S. Control Board).
22) Unsolder the Pink, Purple and Orange lead wires (from Shutter Unit).

(Bottom of Body) (See Fig. 14)

23) Unsolder the Blue and Black lead wires (from Battery Switch).
24) Unsolder the 2 soldered joints between the D.B. FPC and the Main FPC.
25) Unsolder the 4 soldered joints between the AFPI FPC and the Main FPC.

Note: Do not unsolder the Green and Yellow lead wires on the AFPI FPC.

(See Fig. 13)

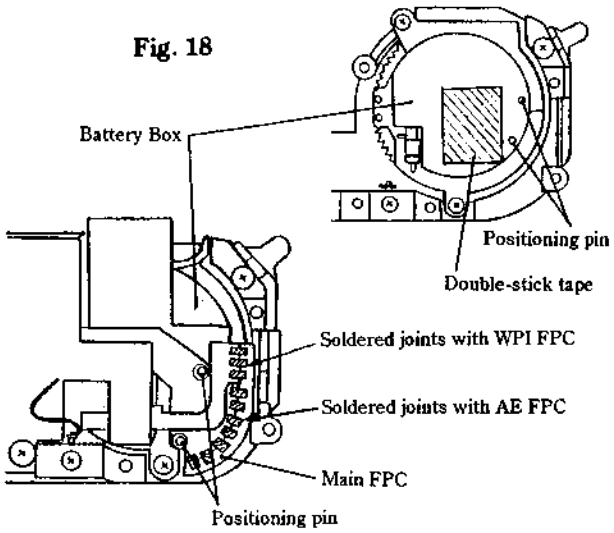
26) Remove the RW Button Holder Setscrews (61913026) and take off the RW Button Holder (1AQ28200) and RW Button (3AQ65100).
27) Remove the FPC Connect Plate Setscrews (66001042)×2 and take off the FPC Connect Plate (1AM12200), FPC Connect Rubber (1AM12500) and FPC Connect Post (1AQ14500)×2.

(Front Left of Body)

28) Remove the Main FPC Ass'y Setscrew (61912222) and take off the Main FPC Ass'y (1AQE1000).

Note: At the soldered joints between the Main FPC Ass'y and the AE FPC or the WPI FPC, the Main FPC Ass'y can come off the positioning pin in the Battery Box. In such a case, a short circuit may occur between the Dial Base Plate and the soldered joints. To prevent such a trouble, the Main FPC is fixed to the Battery Box with double-stick tape (See Fig. 18).

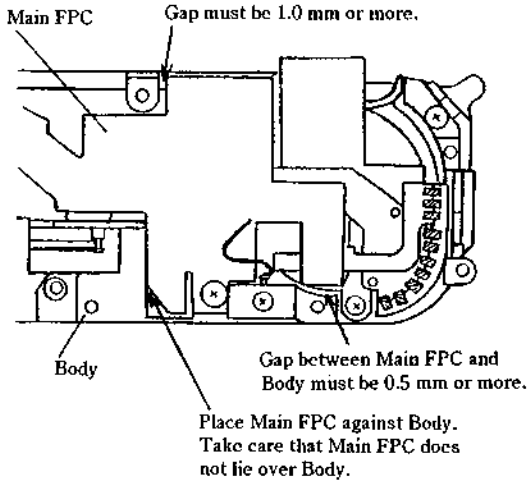
Fig. 18



[Notes on Installation of Main FPC Ass'y]

The Main FPC can be caught and broken between the Dial Base Plate and the Body. To avoid such a trouble, install the Main FPC as shown in Fig. 19.

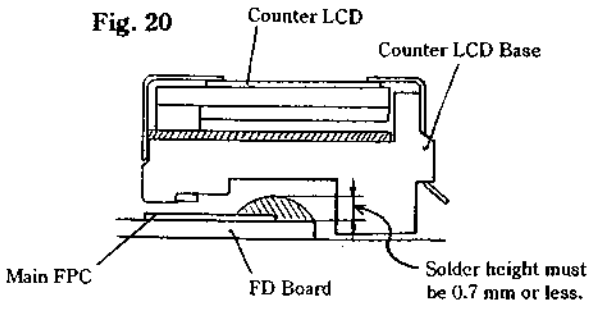
Fig. 19


Main FPC
Gap must be 1.0 mm or more.
Body
Gap between Main FPC and Body must be 0.5 mm or more.
Place Main FPC against Body. Take care that Main FPC does not lie over Body.

[Notes on Soldering of Main FPC]

If the solder of the soldered joints between the FD Board and the Main FPC is too high, it can push the Counter LCD and break Counter LCD segments. Therefore, the solder height must be 0.7 mm or less. (See Figs. 15 and 20)

Fig. 20



B-3. REMOVAL OF WINDING UNIT ASS'Y & MOUNT BASE ASS'Y

B-3-1. Removal of Winding Unit Ass'y

1) Remove the Winding Unit Ass'y Setscrews (61813026)×5 and take off the Winding Unit Ass'y (1AQC4000).

[Notes on Installation of Winding Unit Ass'y]

(See Fig. 22)

a) When installing the Winding Unit Ass'y in the Body, lead out the Pink and Gray lead wires of the Winding Motor through the notch in the Mount Base Ass'y.
b) Lead out the AE FPC through the gap between the Winding Unit Ass'y and the Body.
c) Take care not to catch the WPI FPC between the Winding Unit Ass'y and the Body.
d) Take care not to catch the Brown lead wire of the Shutter between the Winding Unit Ass'y and the Body.

B-3-2. Removal of Mount Base Ass'y

1) Remove the Mount Base Ass'y Setscrews (61923526)×4, (61919526) and take off the Mount Base Support Sleeve (1AQ68100) and Mount Base Ass'y (1AQM1000).

[Sticking of Acetate Cloth Tape]

Acetate Cloth Tape is stuck to the Body to prevent a short circuit that can occur between the connecting portion of the lead wires of the S. Control Board and the Body. (See Fig. 21)
To avoid such a short circuit as mentioned above, take care not to expose the cores at the soldered joint by pulling the lead wires of the S. Control Board.

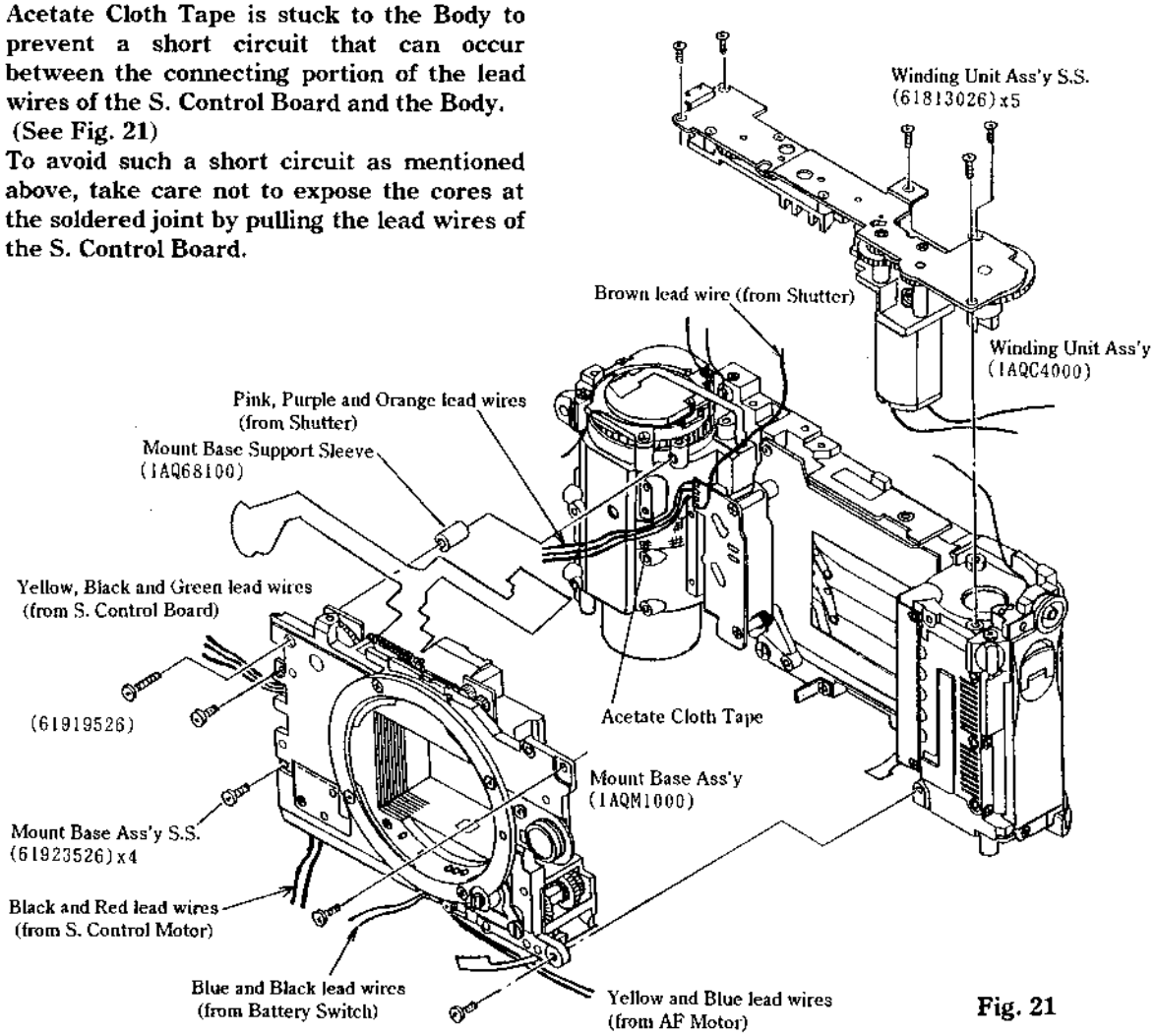


Fig. 21

[Notes on Installation of Mount Base Ass'y]

a) Before installing the Mount Base Ass'y on the Body, make certain that the following instructions are observed:
(See Fig. 21)
① The Pink, Purple and Orange lead wires of the Shutter Unit must be positioned outside. The Brown lead wire of the Shutter Unit must be pulled out upward.
② The Yellow, Black and Green lead wires of the S. Control Board must be led out through the notch.
③ The Black and Red lead wires of the S. Control Motor must be pulled out under the Mount Base Ass'y.
④ The Yellow and Blue lead wires of the AF Motor must be pulled out under the Mount Base Ass'y.
⑤ The Blue and Black lead wires of the Battery Switch (Lens Lock Switch) must be pulled out under the Mount Base Ass'y.

b) After installing the Mount Base Ass'y on the Body, perform the following checks and then tighten the Mount Base Ass'y Setscrews (61923526)×4, (61919526):
(See Fig. 22)
① The Pink, Purple and Orange lead wires of the Shutter Unit and the Yellow, Black and Green lead wires of the S. Control Board are led out through the notch.
② The AF FPC is led out under the Body.
③ No lead wire or FPC is caught between the Mount Base Ass'y and the Body.
(See Fig. 23)
④ The Shutter Charge Lever and Shutter Lever are positioned as shown in Fig. 23.

Fig. 22

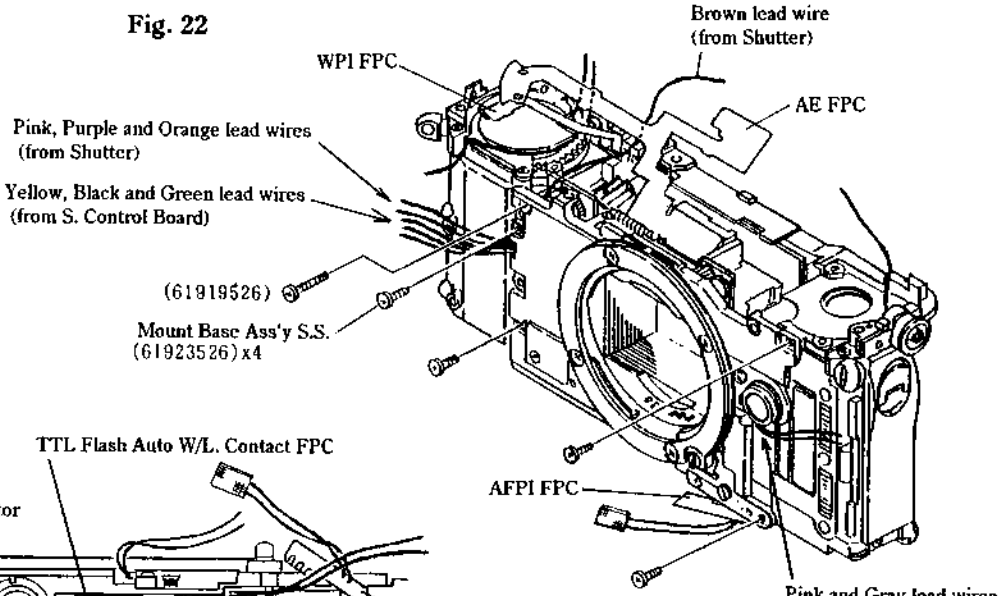
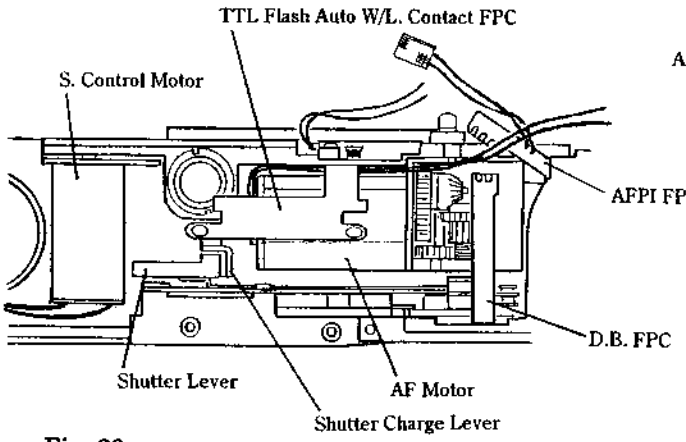


Fig. 23



(Bottom View of Body)

B-4. REMOVAL OF SHUTTER UNIT

B-4-1. Removal of Shutter Unit

1) Remove the Shutter Unit Setscrews (66001049), (6194026)×2 and take off the Mount Base Support Plate (1AQ68000) and the Shutter Unit (1AQ35010).

Notes: a) The blades of the Shutter Unit are made with precision. Never touch the blades with your finger nor push them with any tool.

b) Never clean the blades of the Shutter Unit with ether alcohol.

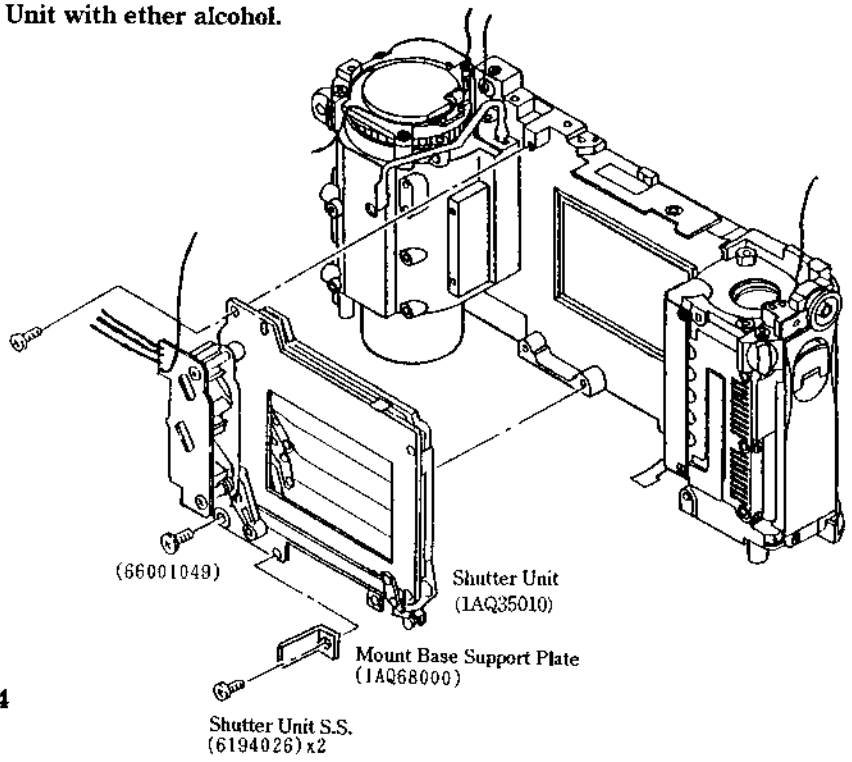


Fig. 24

[Layout of Lead Wires of Shutter Unit]

① Pink lead wire (VB)
② Orange lead wire (Shutter Magnet 1)
③ Purple lead wire (Shutter Magnet 2)
④ Brown lead wire (X)

(Front View of Shutter)

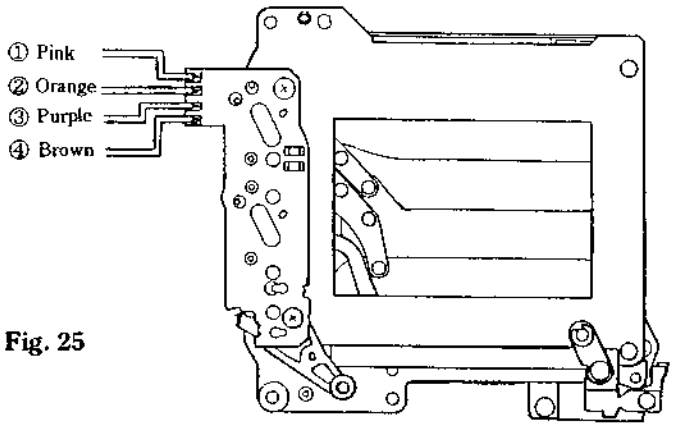


Fig. 25

B-5. REMOVAL OF OTHER PARTS

B-5-1. Removal of DX Ass'y

1) Remove the B. Lock Ass'y Setscrews (63913026)×2 and take off the B. Lock Ass'y (1AQB9000) in the direction of the arrow.
2) Remove the DX Ass'y Setscrews (61813026)×2 and DX FPC Setscrews (61913022)×2 and take off the DX Ass'y (1AQA3300).

Note: Remove the DX Ass'y carefully, since the Ⓐ area of the DX Ass'y is fixed to the Body with the Test Terminal Tape (1AQ13200).

[Notes on Installation of B. Lock Ass'y]

a) Take care not to bend or deform the B. Lock Plate Contact.
b) Clean the pattern of the DX FPC and the B. Lock Plate Contact with lens cleaning paper with ether alcohol.
c) After installing the B. Lock Ass'y (1AQB9000) on the Body, push it downward and tighten the B. Lock Ass'y Setscrews (63913026)×2.

[Notes on Installation of DX Ass'y]

a) After installing the DX Ass'y (1AQA3300), push it in the direction of the arrow and tighten the DX Ass'y Setscrews (61813026)×2.

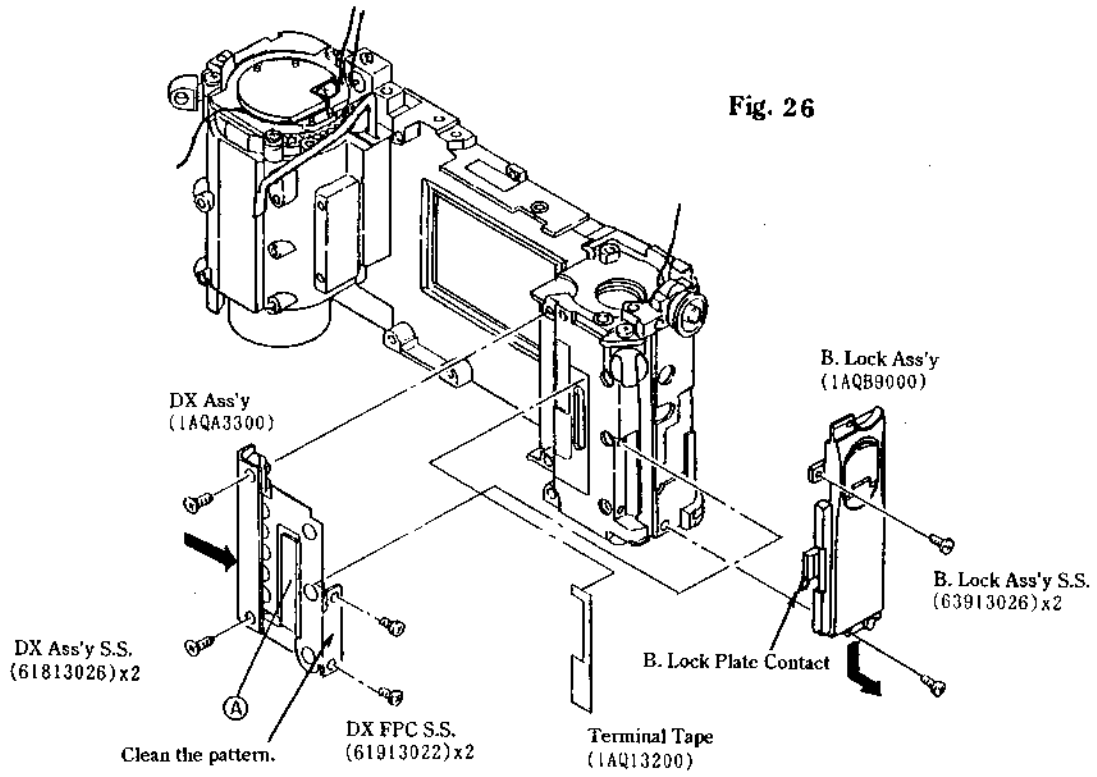


Fig. 26

B-5-2. Removal of Spool

1) Peel off the Battery Seal (1AQ11900).
2) Remove the Battery Cap Holder Ass'y Setscrews (61913022)×2 and take off the Battery Cap Holder Ass'y (1AQA3200).
3) Remove the Battery Box Setscrews (61913526)×2 and take off the Battery Box (1AQ11400) and Spool (1AQ31200).
4) Remove the Spool Holder Setscrews (61913026)×2 and take off the Spool Holder (1AQ31300).

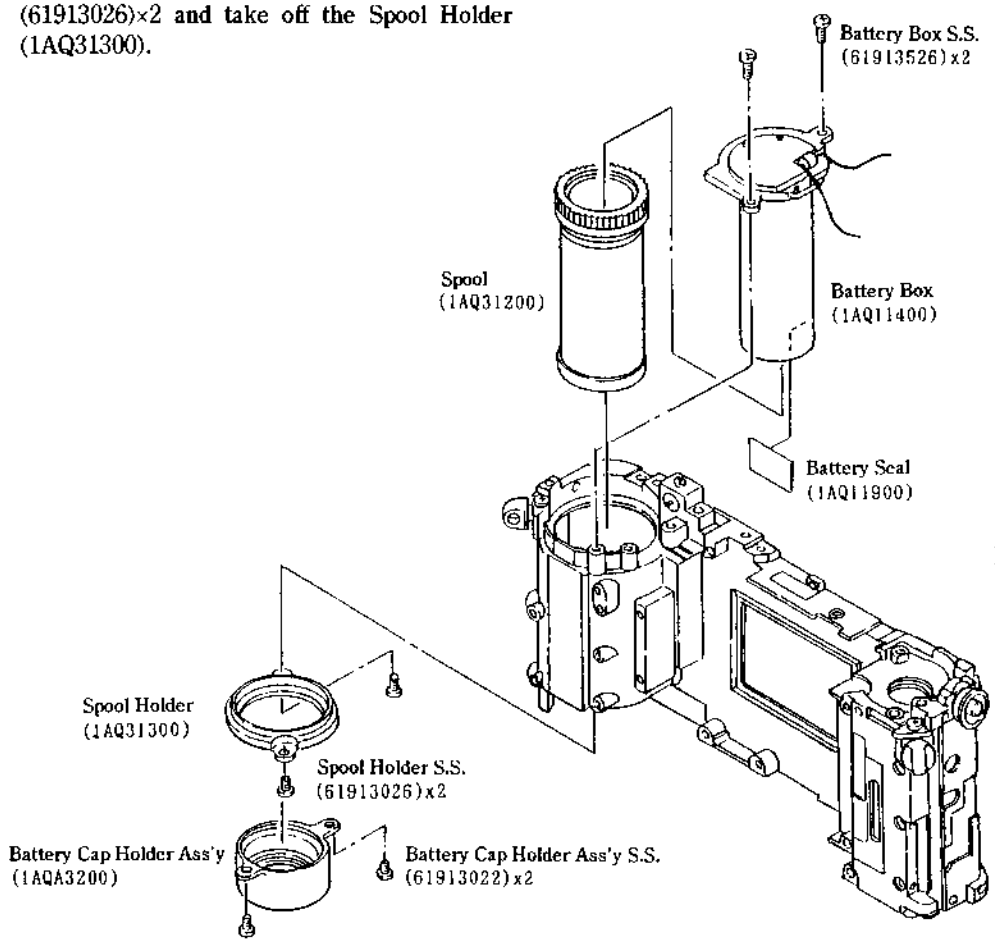
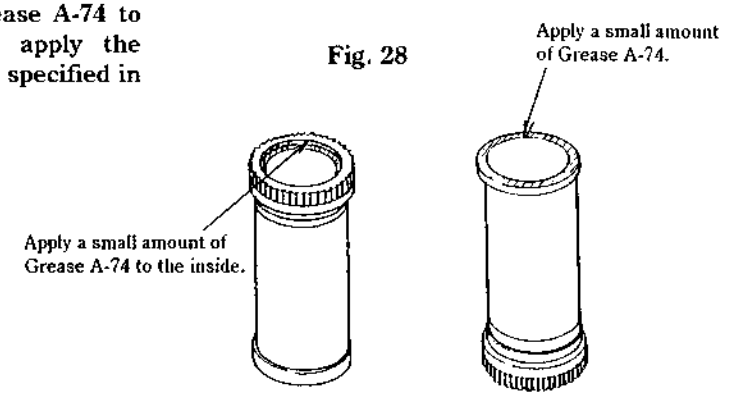


Fig. 27

[Notes on Grease Application to Spool]

a) Apply a small amount of Grease A-74 to the Spool. However, never apply the grease to any area other than specified in Fig. 28.

Fig. 28



B-5-4. Removal of Other Parts

1) Remove the Body Auxiliary Plate Setscrew (61912026) and take off the Body Auxiliary Plate (Left) (1AQ155300).
2) Remove the WPI FPC Ass'y Setscrews (61813029)×2 and take off the WPI FPC Ass'y (1AQE9000).
3) Remove the F. Roller (3) Lever Ass'y Setscrews (61915026)×2 and take off the F. Roller (3) Lever Ass'y (1AQA3100).
4) Remove the Contact Cover Setscrews (61913029)×2 and take off the Contact Cover (1AQ13800) and D.B. FPC (1AQ51100).

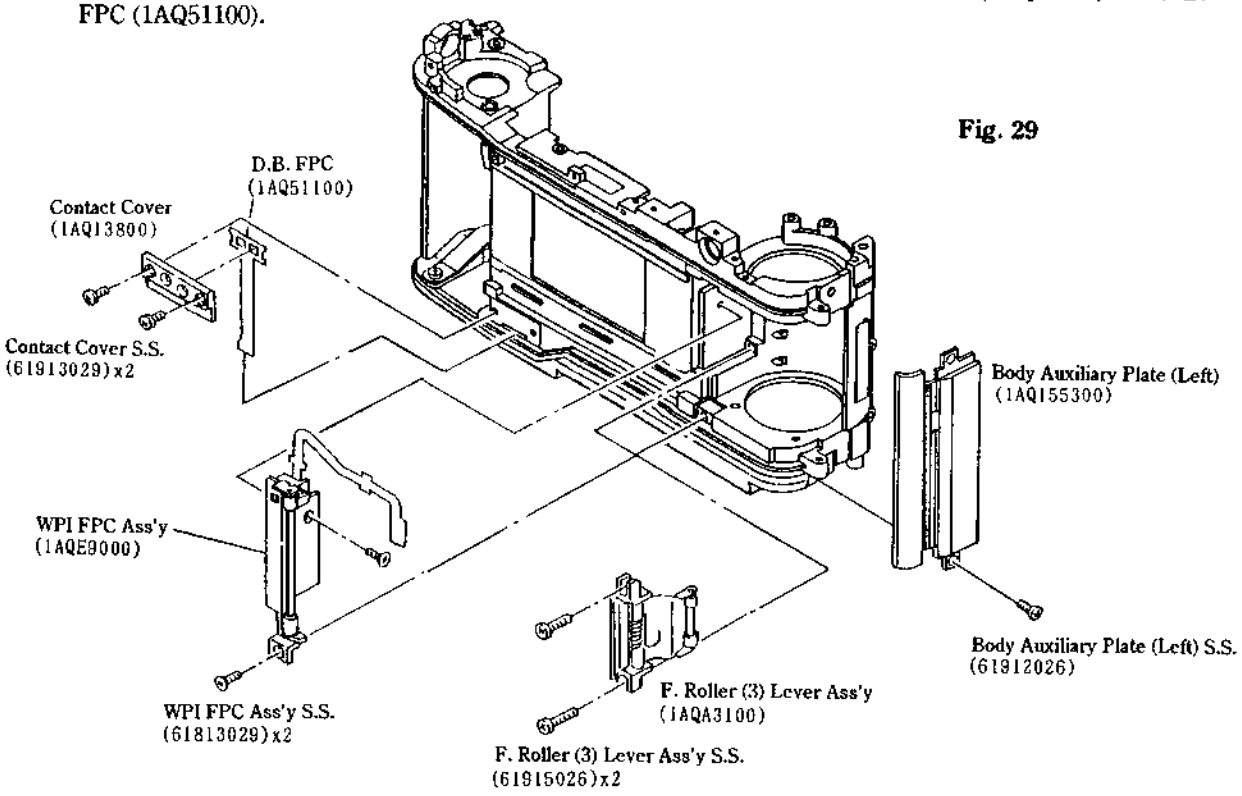


Fig. 29

[Notes on Installation of WPI Moquette]

a) Lead out the WPI FPC through the groove in the Body while taking care not to bend or break the WPI FPC.
b) Stick the WPI Moquette (1AQ31400) on the WPI FPC as shown in Fig. 30. Then push half of the WPI Moquette into the groove in the Body.

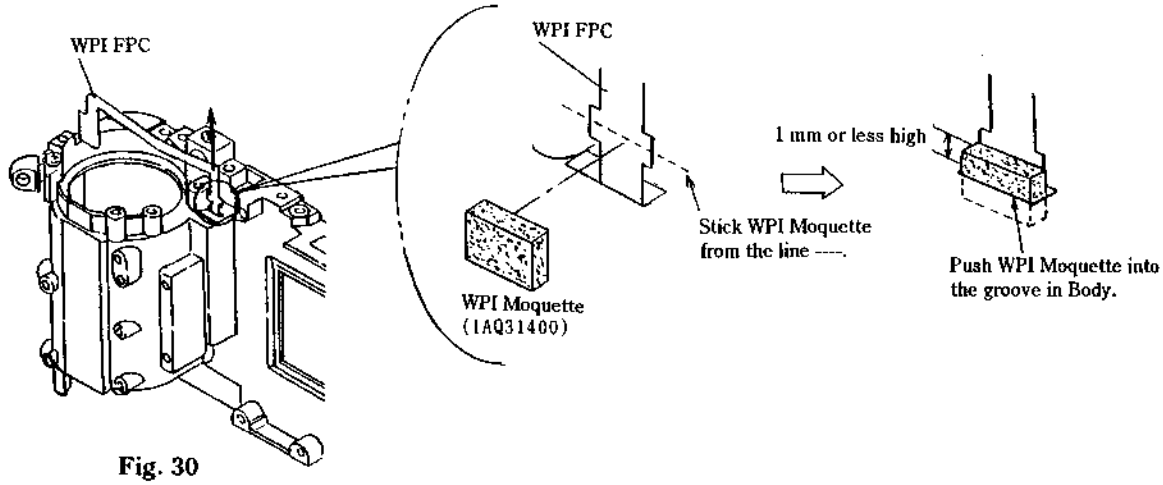


Fig. 30

B-6. DISASSEMBLY OF MOUNT BASE ASS'Y

[Chart for Disassembly of Mount Base Ass'y]

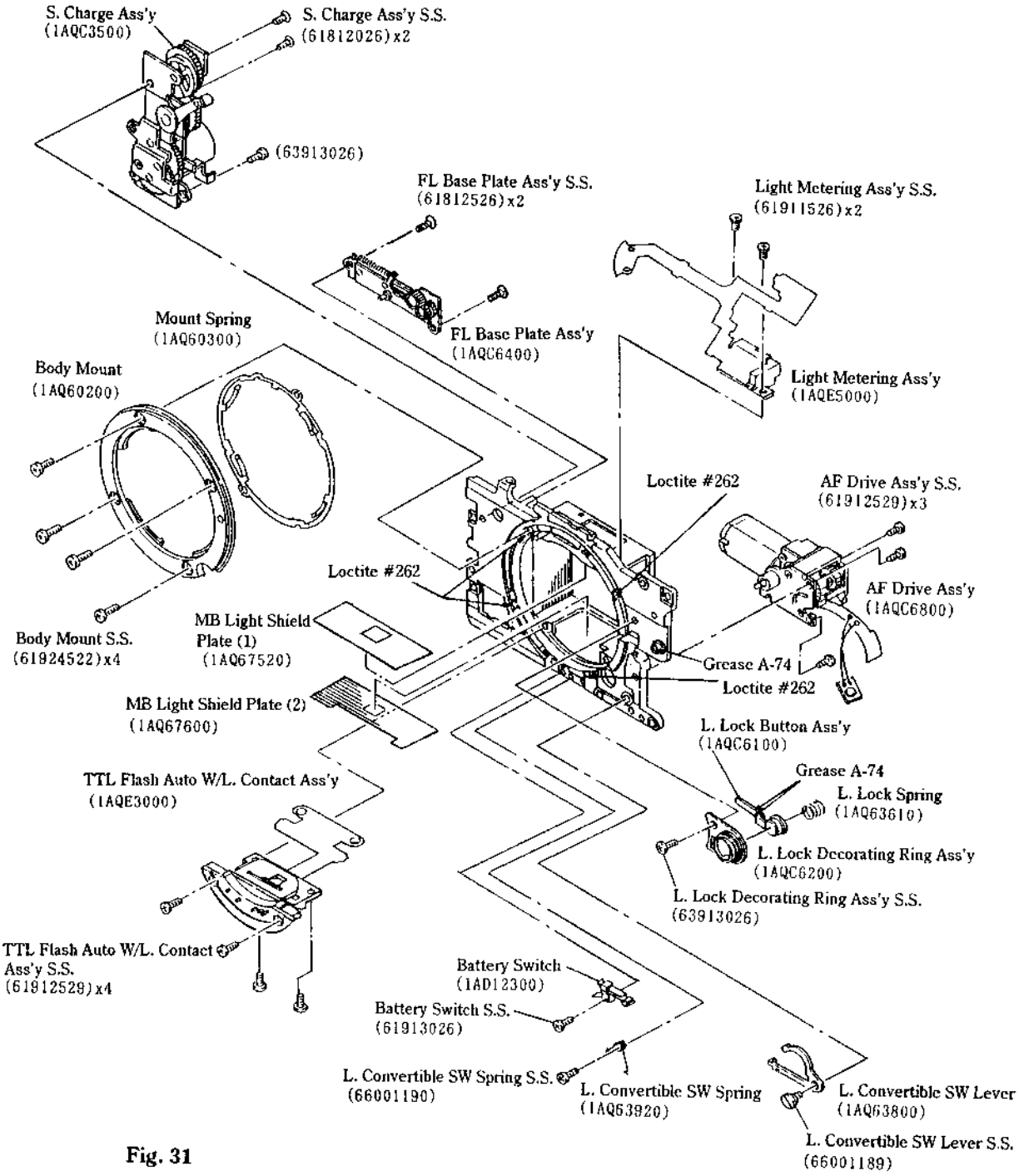


Fig. 31

B-6-1. Disassembly of Mount Base Ass'y

(See Fig. 31)

1) Remove the S. Charge Ass'y Setscrews (63913026), (61812026)×2 and take off the S. Charge Ass'y (1AQC3500).
2) Remove the Body Mount Setscrews (61924522)×4 and take off the Body Mount (1AQ60200) and Mount Spring (1AQ60300).

Note: Remove the Body Mount Setscrews carefully, since they are locked with Loctite #262. Especially, take great care not to damage the screw head with a screwdriver.

3) Remove the AF Drive Ass'y Setscrews (61912529)×3 and take off the AF Drive Ass'y (1AQC6800).
4) Peel off the MB Light Shield Plate (2) (1AQ67600).

Notes: a) MB Light Shield Plate (2) is fixed to the Mount Base with double-stick tape.
b) Do not use the MB Light Shield Plate (2), once it has been peeled off.

5) Remove the TTL Flash Auto W/L. Contact Ass'y Setscrews (61912529)×4 and take off the TTL Flash Auto W/L. Contact Ass'y (1AQE3000).
6) Peel off the MB Light Shield Plate (1) (1AQ67520).

Notes: a) MB Light Shield Plate (1) is fixed to the Mount Base with double-stick tape.
b) Do not use the MB Light Shield Plate (1), once it has been peeled off.

7) Remove the Light Metering Ass'y Setscrew (61911526) and take off the Light Metering Ass'y (1AQE5000).
8) Remove the FL Base Plate Ass'y Setscrews (61812526)×2 and take off the FL Base Plate Ass'y (1AQC6400).
9) Remove the L. Convertible SW Spring Setscrews (66001190) and take off the L. Convertible SW Spring (1AQ63920).
10) Remove the Battery Switch Setscrew (61913026) and take off the Battery Switch (1AD12300).
11) Remove the L. Convertible SW Lever Setscrew (66001189) and take off the L. Convertible SW Lever (1AQ63800).
12) Remove the L. Lock Decorating Ring Ass'y Setscrew (63913026) and take off the L. Lock Decorating Ring Ass'y (1AQC6200), L. Lock Button Ass'y (1AQC6100) and L. Lock Spring (1AQ63610).

[Note on Installation of L. Lock Decorating Ring Ass'y]

a) Before tightening the L. Lock Decorating Ring Ass'y Setscrew, adjust the position of the L. Lock Decorating Ring Ass'y so that the L. Lock Decorating Ring Ass'y does not rub on the L. Lock Button Ass'y.

[Notes on Handling of AF Drive Ass'y]

a) Do not disassemble the AF Drive Ass'y; otherwise, faulty auto focusing can occur.
Once the AF Drive Ass'y has been disassembled, it is necessary to make the time adjustment of AF pulse width. This time adjustment of AF pulse width requires a special adjusting jig. However, the special adjusting jig is not supplied. Therefore, if the AF Drive Ass'y (1AQC6800) is found defective, replace it with a new one.
b) The variable resistor is wrapped with acetate cloth tape. Do not peel off the acetate cloth tape. Also do not change the setting of the variable resistor.
Do not try to replace only the variable resistor, since the variable resistor is part of the AF Drive Ass'y.
c) The AF Drive Ass'y as a service part will be supplied with the time adjustment of the AF pulse width already made.

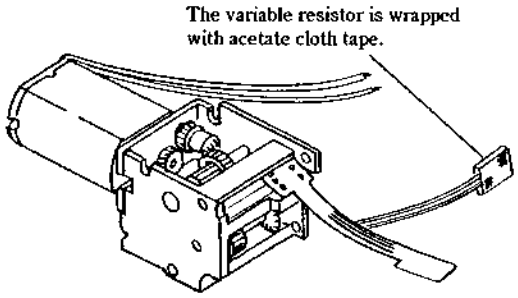


Fig. 32

[Installation of FL Base Plate Ass'y and Operation Check]

1) Install the FL Base Plate Ass'y (1AQC6400) on the Mount Base and tighten the FL Base Plate Ass'y Setscrews (61812526)×2.

Note: In the course of production, the FL Base Plate Ass'y Setscrew (61912526) (pan head machine screw) was changed to (61812526) (flat head machine screw) to ensure the correct positioning of the FL Base Plate Ass'y.
Change the part number of the item No. 16 on page No. 5 in the Assembling Chart.

2) Move the FL Pin and make certain that it moves smoothly.

① Move the FL Pin to the right as viewed from the front and check to see if it becomes heavy on the way.
② Return the FL Pin slowly from right to left and check to see if it is caught and stopped on the way.

Note: When moving the FL Pin, take care not to scrape the coating off the Mount Base.

3) If the FL Pin is found caught or stopped, remove the FL Base Plate Ass'y once and then install it again.

Note: The FL Pin does not move smoothly unless the FL Base Plate Ass'y is installed in parallel with the Mount Base.

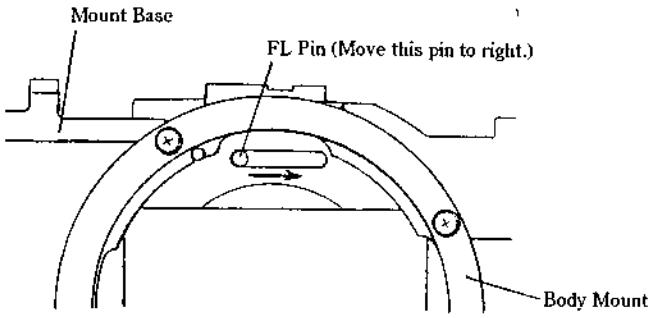
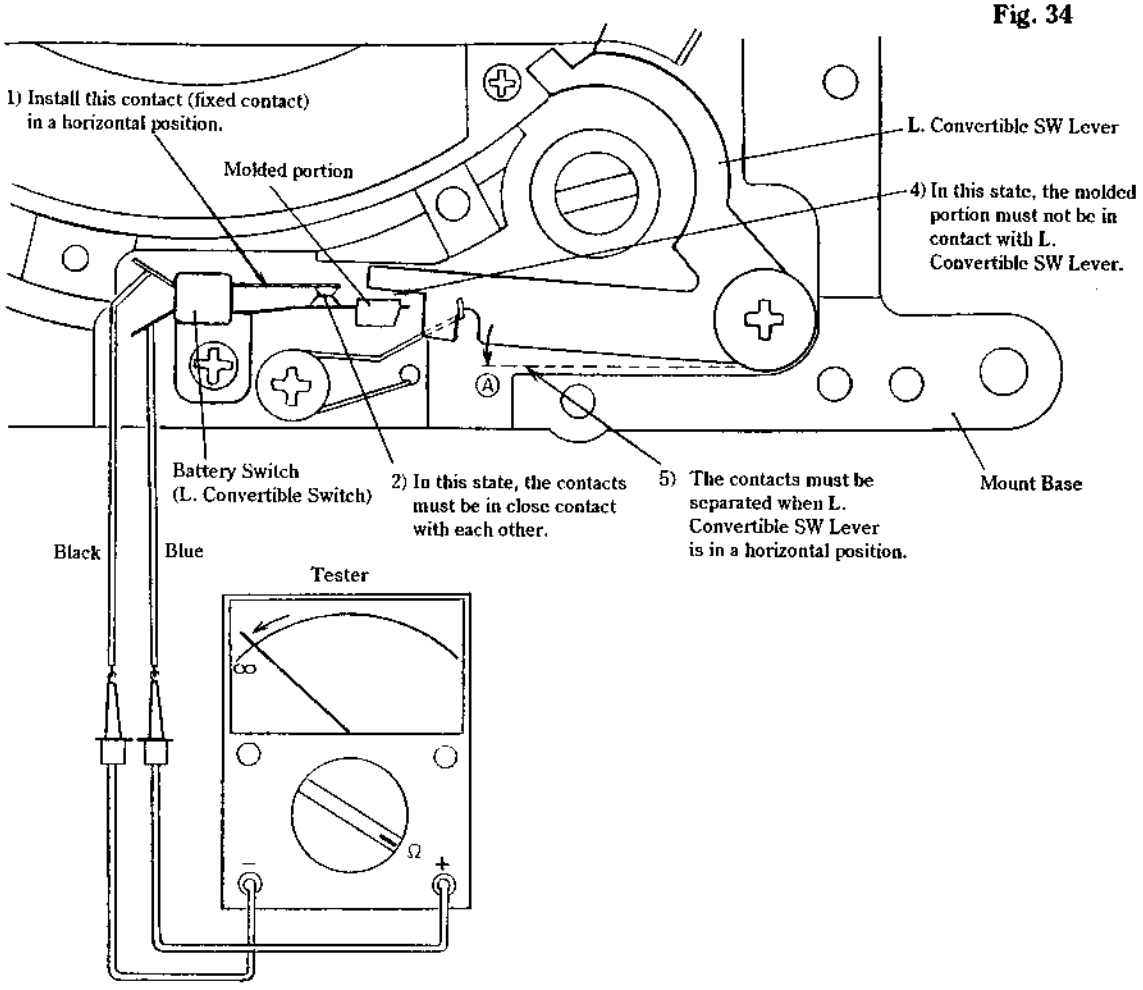


Fig. 33

[Installation of Battery Switch (L. Convertible Switch) and Check]

1) Install the Battery Switch (1AD12300) so that the upper contact (fixed contact) is in a horizontal position.
2) Tighten the Battery Switch Setscrew (61913026).
3) In this state, make certain that the contacts of the Battery Switch are not separated.
4) Make certain that the molded portion at the tip of the Battery Switch, when in a position as shown in Fig. 34, is not in contact with the L. Convertible SW Lever.
5) Push the L. Convertible SW Lever in the direction of the arrow Ⓐ and make certain that the contacts of the Battery Switch are separated when the L. Convertible SW Lever comes in a horizontal position.
6) Install the Mount Spring (1AQ60300) and Body Mount (1AQ60220) and tighten the Body Mount Setscrews (61924522)×4.
7) Connect the Black and Blue lead wires of the Battery Switch to the terminals of the tester.
8) Set the range selector switch of the tester to "Ω".
9) Install the lens on the Body Mount.
   At this point, make certain that the pointer of the tester moves in the direction of "∞". (The Battery Switch must be turned OFF)

Fig. 34

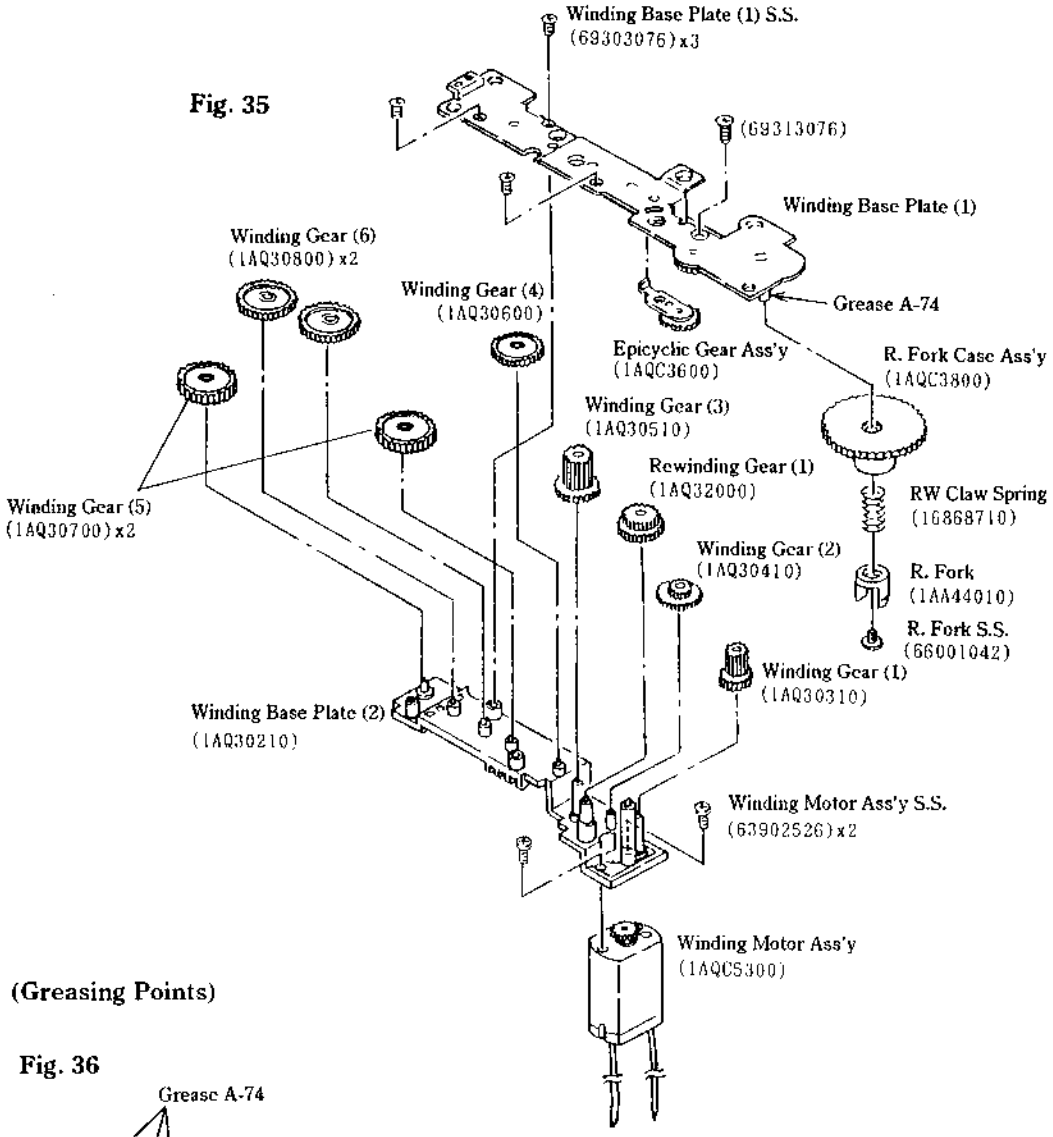

1) Install this contact (fixed contact) in a horizontal position.
Molded portion
L. Convertible SW Lever
4) In this state, the molded portion must not be in contact with L. Convertible SW Lever.
Ⓐ
Battery Switch (L. Convertible Switch)
2) In this state, the contacts must be in close contact with each other.
5) The contacts must be separated when L. Convertible SW Lever is in a horizontal position.
Mount Base
Black
Blue
Tester
∞
Ω
−
+

B-7. DISASSEMBLY AND REASSEMBLY PROCEDURES FOR ASS'Y PARTS

B-7-1. Disassembly of Winding Unit Ass'y

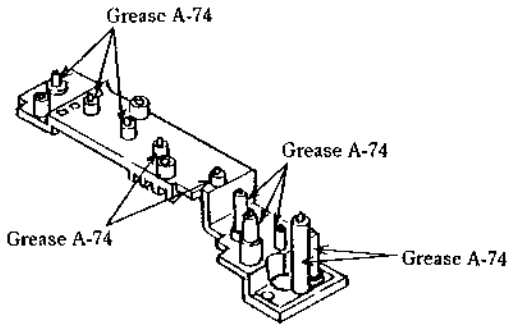
1) Remove the Winding Base Plate (1) Setscrews (69303076)×3, (69313076) and take off the Winding Base Plate (1).
2) Remove the Epicyclic Gear Ass'y (1AQC3600) and take off the gears as shown in Fig. 35.
3) Remove the Winding Motor Ass'y Setscrews (63902526)×2 and take off the Winding Motor Ass'y (1AQC5300).
4) Remove the R. Fork Setscrew (66001042) and take off the R. Fork (1AA44010), RW Claw Spring (16868710) and R. Fork Case Ass'y (1AQC3800).

Fig. 35



(Greasing Points)

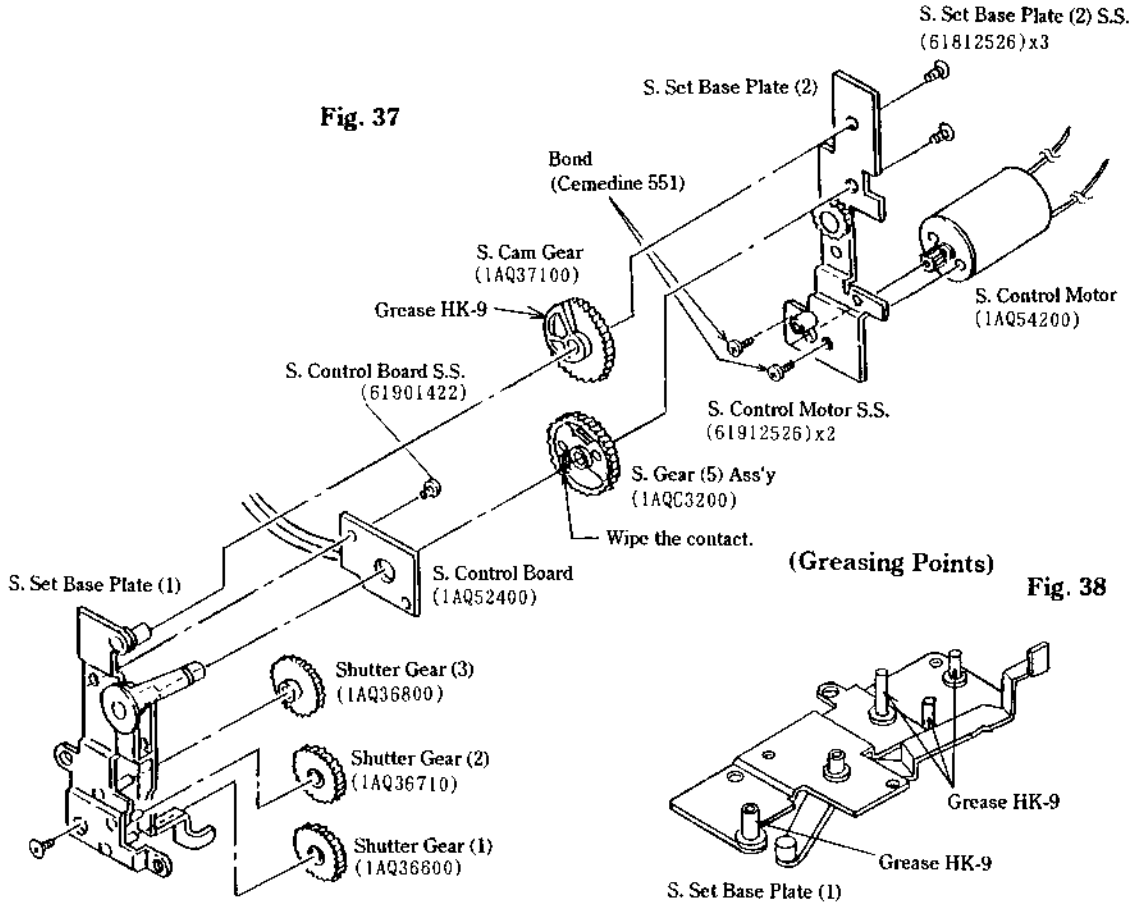
Fig. 36



B-7-2. Disassembly of S. Charge Ass'y

1) Remove the S. Set Base Plate (2) Setscrews (61812526)×3 and take off the S. Set Base Plate (2).
2) Remove the gears as shown in Fig. 37.
3) Remove the S. Control Board Setscrew (61901422) and take off the S. Control Board (1AQ52400).
4) Remove the S. Control Motor Setscrews (61912526)×2 and take off the S. Control Motor (1AQ54200).

Fig. 37



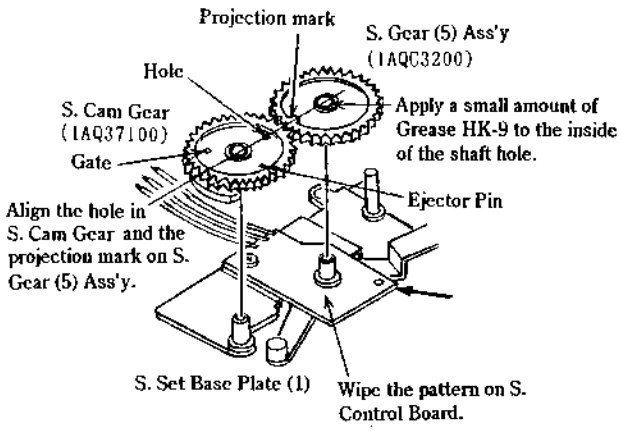
(Greasing Points)

Fig. 38

[Notes on Reassembly of S. Charge Ass'y]

a) Take care not to bend or deform the contacts of the S. Gear (5) Ass'y.
b) Clean carefully the contacts of the S. Gear (5) Ass'y and the pattern of the S. Control Board with lens cleaning paper with ether alcohol.
c) Push the S. Control Board in the direction of the arrow (Fig. 39) and tighten the S. Control Board Setscrew (61901422).
d) Align the hole in the S. Cam Gear and the projection mark on the S. Gear (5) Ass'y. In doing so, do not confuse the hole in the S. Cam Gear with the Ejector Pin.

Fig. 39


Projection mark
S. Gear (5) Ass'y
(1AQC3200)
Hole
S. Cam Gear
(1AQ37100)
Apply a small amount of Grease HK-9 to the inside of the shaft hole.
Gate
Ejector Pin
Align the hole in S. Cam Gear and the projection mark on S. Gear (5) Ass'y.
S. Set Base Plate (1)
Wipe the pattern on S. Control Board.

B-7-3. How to Attach Window Glasses of Top Cover Ass'y

1) Apply a thin film of the bond (epoxy resin) to the inside of the F. Window Frame (1AQ20200). Then attach the F. Window (1AQ20300) to the F. Window Frame.
2) Place the F. Mask (1AQ20600) on the back of the F. Window and fix it by applying the bond (Cemedine 551) at five points.
3) Install the F. Window Frame W/F. Window from inside the Top Cover and apply the bond (epoxy resin) to the periphery.
4) Apply a thin film of the bond (epoxy resin) to the inside of the AF Window Frame (1AQ20400). Then attach the AF Window (1AQ20500) to the AF Window Frame.
5) Place the AF Mask (1AQ20800) on the back of the AF Window and fix it by applying the bond (Cemedine 551) at five points.
6) Install the AF Window Frame W/AF Window from inside the Top Cover and apply the bond (epoxy resin) to the periphery.
7) Place the ST-LED Window (1AQ21000) on the AF Window Frame and apply the bond (epoxy resin).
8) Install the AF-assist Beam Emitter Window (1AQ20700), LCD Window (1AQ20900) and Counter Window (3BK32200) from inside the Top Cover and apply the bond (epoxy resin) to the periphery.

Notes: a) The window glasses of the Top Cover Ass'y are fixed with UV bond (ultraviolet bond). The UV bond will not be supplied for use at repair. Use the epoxy resin bond instead of the UV bond at repair.

b) Epoxy resin bond hardens slowly. Be sure to wait until the bond hardens completely and then install the Top Cover Ass'y on the Body. (Wait for 24 hours.)

c) To remove the UV bond, heat the bond with a dryer for a while and scrape off the UV bond with an NT cutter. In doing so, take care that other window glasses will not be affected by overheating with the dryer.

d) Take care not to deposit bond too high.

e) Take care that bond does not come out around. Especially, when attaching the F. Window and AF Window to the F. Window Frame and AF Window Frame, take great care that bond does not come out, since the allowable area for applying bond is very small. Also take care not to soil the window glasses with bond.

f) All the window glasses must be in close contact with the Top Cover. Pay special attention to the LCD Window.

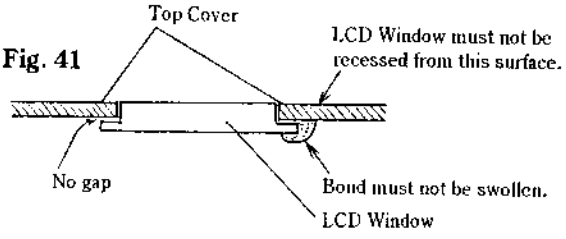


Fig. 41

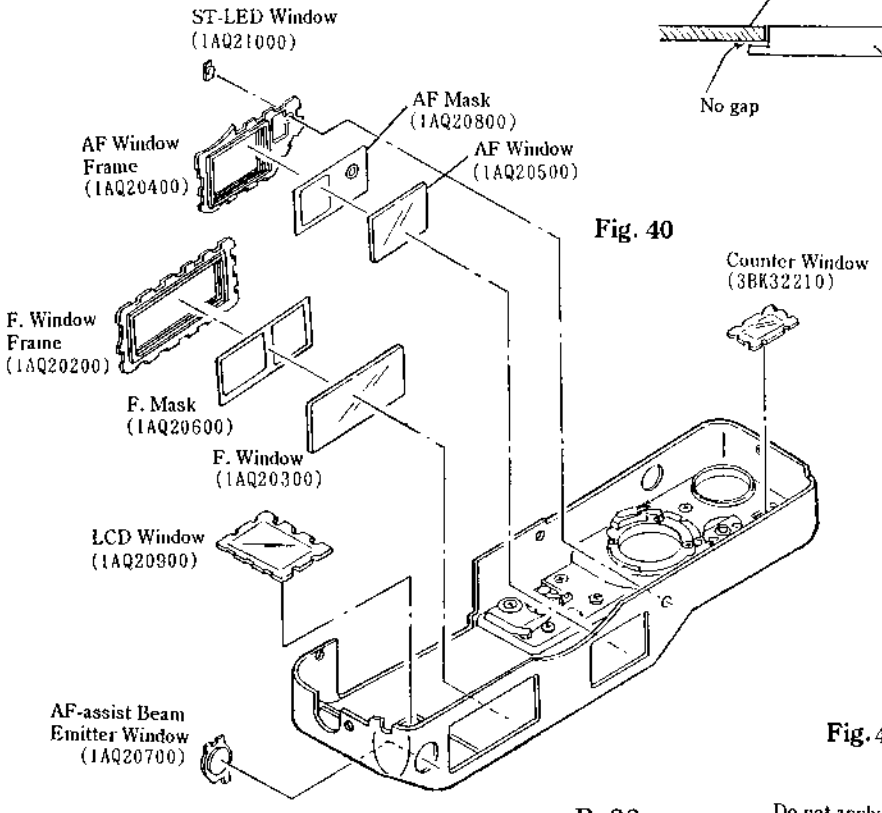


Fig. 40

(Sticking Points of F. Mask and AF Mask)

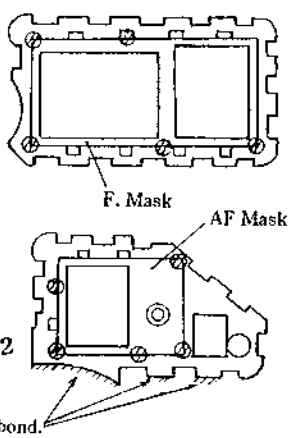


Fig. 42

B-8. DRESSING OF LEAD WIRES

B-8-1. Dressing of Lead Wires

1) Dress the lead wires as shown in Figs. 43 to 47:

[Chart for Dressing of Power Supply Lead Wires]

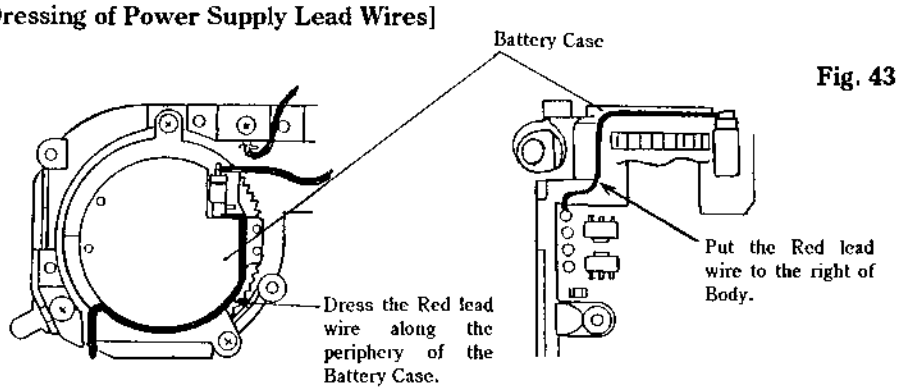


Fig. 43

[Chart for Dressing of Lead Wires on Left Side of Body]

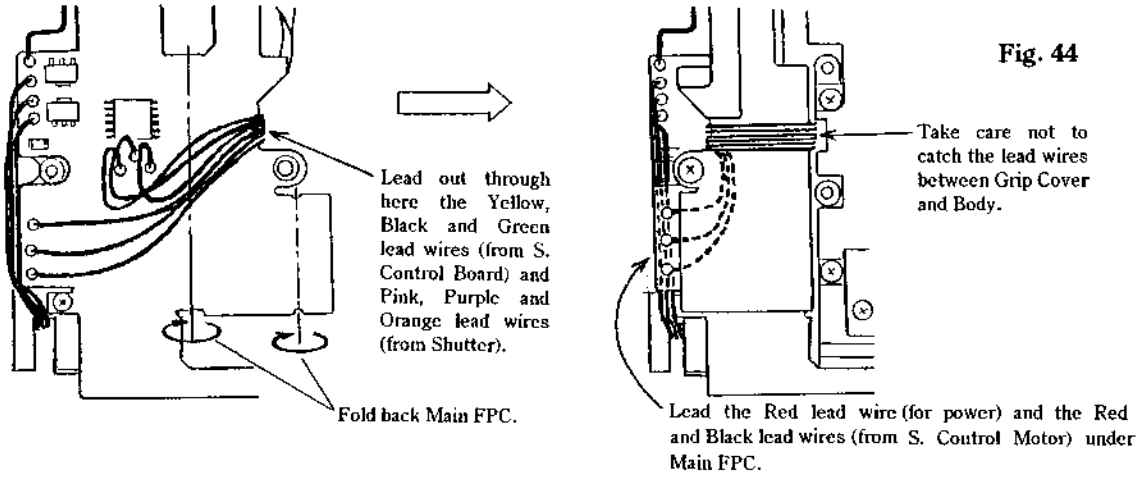

Lead out through here the Yellow, Black and Green lead wires (from S. Control Board) and Pink, Purple and Orange lead wires (from Shutter).
Fold back Main FPC.
Take care not to catch the lead wires between Grip Cover and Body.
Lead the Red lead wire (for power) and the Red and Black lead wires (from S. Control Motor) under Main FPC.

Fig. 44

[Chart for Dressing of Lead Wires on Right Side of Body]

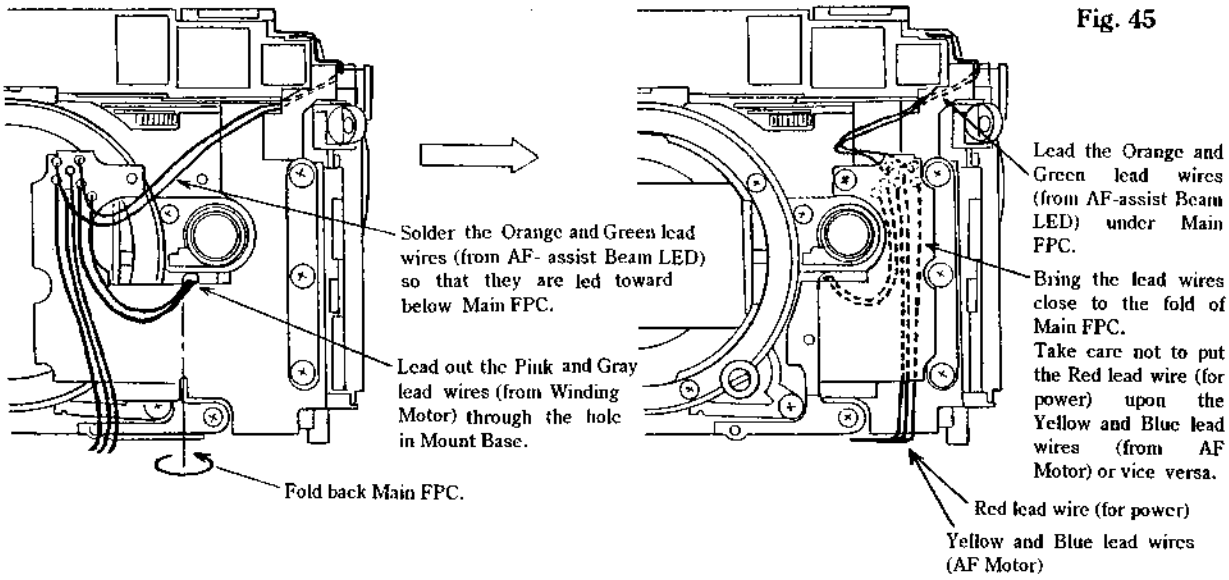

Solder the Orange and Green lead wires (from AF- assist Beam LED) so that they are led toward below Main FPC.
Lead out the Pink and Gray lead wires (from Winding Motor) through the hole in Mount Base.
Fold back Main FPC.
Lead the Orange and Green lead wires (from AF-assist Beam LED) under Main FPC.
Bring the lead wires close to the fold of Main FPC.
Take care not to put the Red lead wire (for power) upon the Yellow and Blue lead wires (from AF Motor) or vice versa.
Red lead wire (for power)
Yellow and Blue lead wires (AF Motor)

Fig. 45

[Chart for Dressing of Lead Wires on Top of Body]

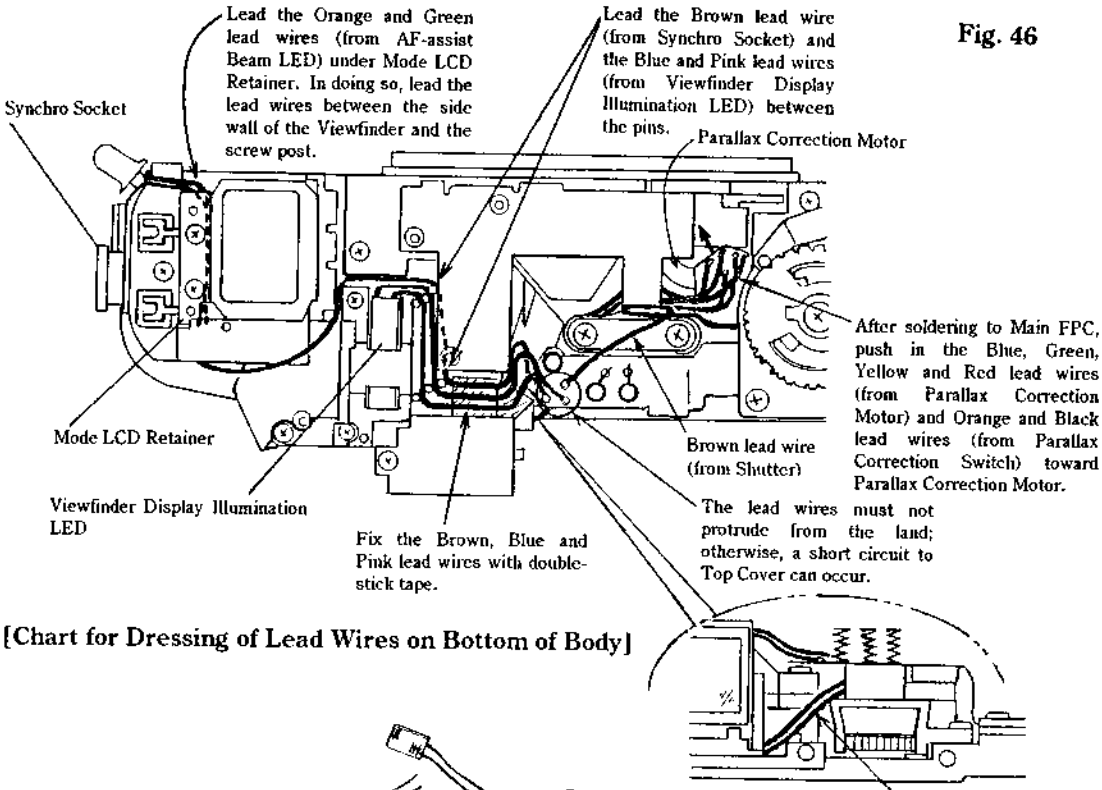

Lead the Orange and Green lead wires (from AF-assist Beam LED) under Mode LCD Retainer. In doing so, lead the lead wires between the side wall of the Viewfinder and the screw post.
Lead the Brown lead wire (from Synchro Socket) and the Blue and Pink lead wires (from Viewfinder Display Illumination LED) between the pins.
Synchro Socket
Parallax Correction Motor
After soldering to Main FPC, push in the Blue, Green, Yellow and Red lead wires (from Parallax Correction Motor) and Orange and Black lead wires (from Parallax Correction Switch) toward Parallax Correction Motor.
Mode LCD Retainer
Brown lead wire (from Shutter)
Viewfinder Display Illumination LED
The lead wires must not protrude from the land; otherwise, a short circuit to Top Cover can occur.
Fix the Brown, Blue and Pink lead wires with double-stick tape.

Fig. 46

[Chart for Dressing of Lead Wires on Bottom of Body]

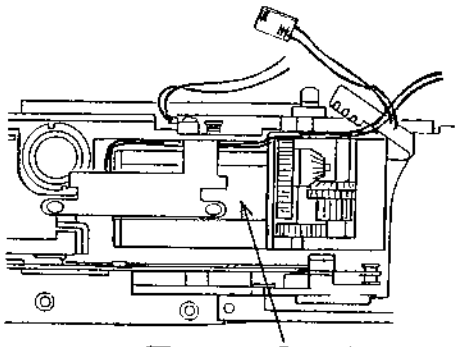
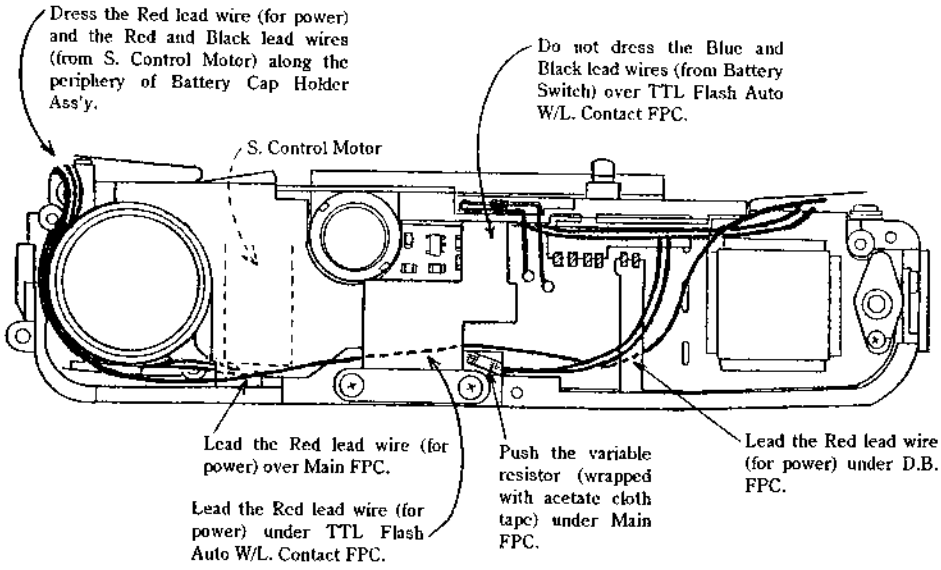


Fig. 47


Dress the Red lead wire (for power) and the Red and Black lead wires (from S. Control Motor) along the periphery of Battery Cap Holder Ass'y.
Do not dress the Blue and Black lead wires (from Battery Switch) over TTL Flash Auto W/L. Contact FPC.
S. Control Motor
Lead the Red lead wire (for power) over Main FPC.
Push the variable resistor (wrapped with acetate cloth tape) under Main FPC.
Lead the Red lead wire (for power) under D.B. FPC.
Lead the Red lead wire (for power) under TTL Flash Auto W/L. Contact FPC.

B-9 DISASSEMBLY OF DATA BACK ASS'Y

B-9-1. Disassembly of Data Back Ass'y

1) Disassemble the Data Back Ass'y as shown below.

Note: The D. Battery Contact (+) (2DB10800) and D. Battery Contact (–) (2DB10900) are press-fitted in the Battery Holder (2DB11100) and fixed with the bond (Cemedine 551). (See Fig. 48)

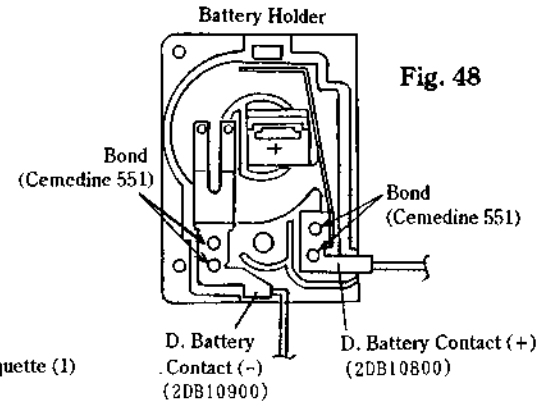


Fig. 48

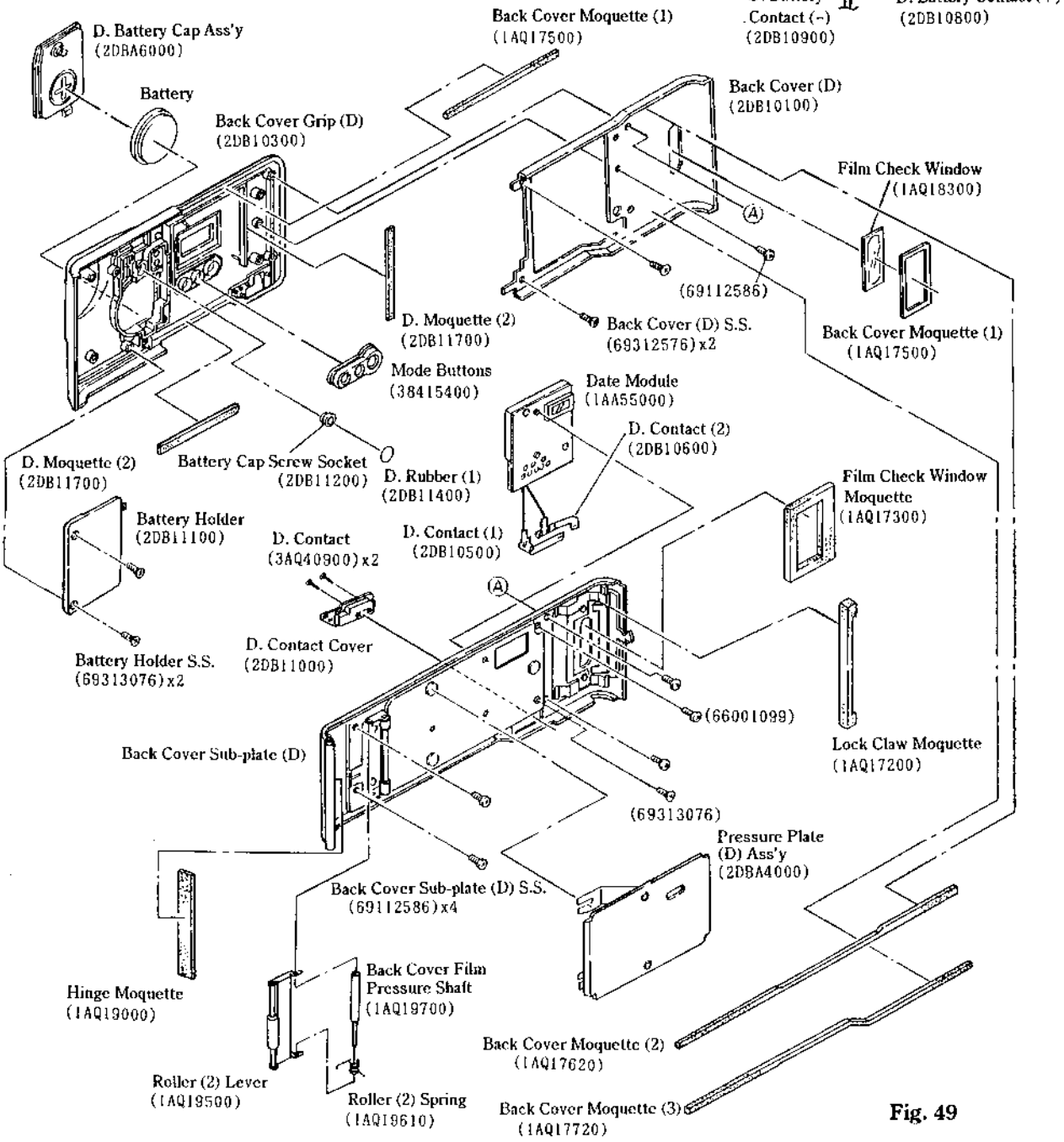


Fig. 49

[Wiring of Auto Date Module and Contacts]

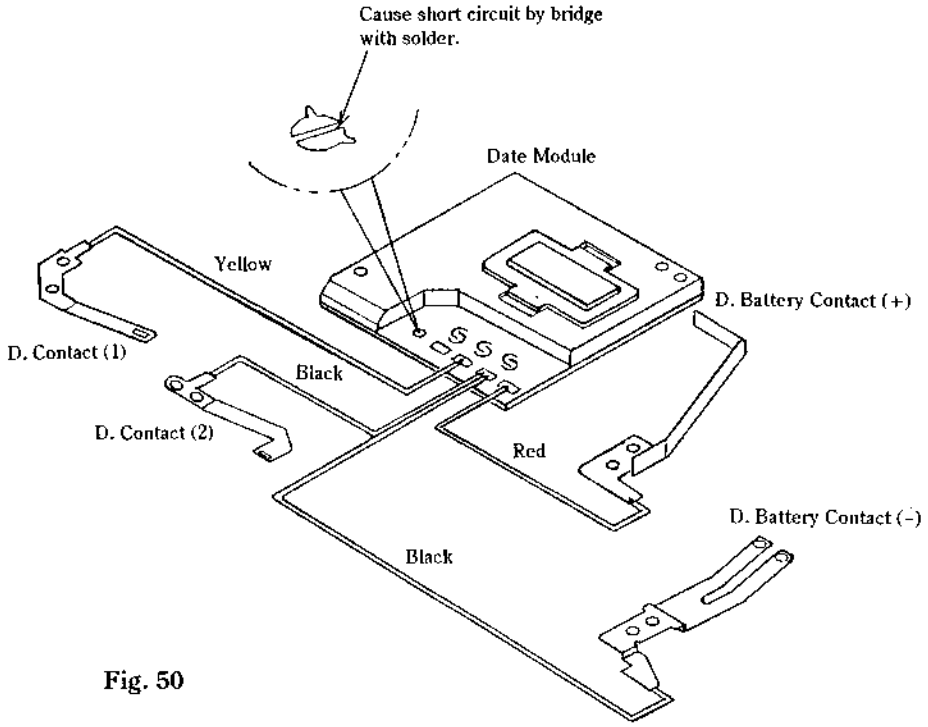


Fig. 50

[Notes on Attaching of Film Check Window]

a) The Film Check Window (1AQ18301) is fixed to the Back Cover (D) (2DB10100) with the UV bond.
The UV bond will not be supplied for use at repair. Use the epoxy resin bond instead of the UV bond at repair.
b) Epoxy resin bond hardens slowly. Be sure to wait until the bond hardens completely and then assemble the Data Back Ass'y. (Wait for 24 hours.)
c) To remove the UV bond, heat the bond with a dryer for a while and scrape off the UV bond with an NT cutter.
d) Take care not to deposit bond too high.
Also take care not to soil the Film Check Window with bond.

No.	419-01-50-RA1AQ01

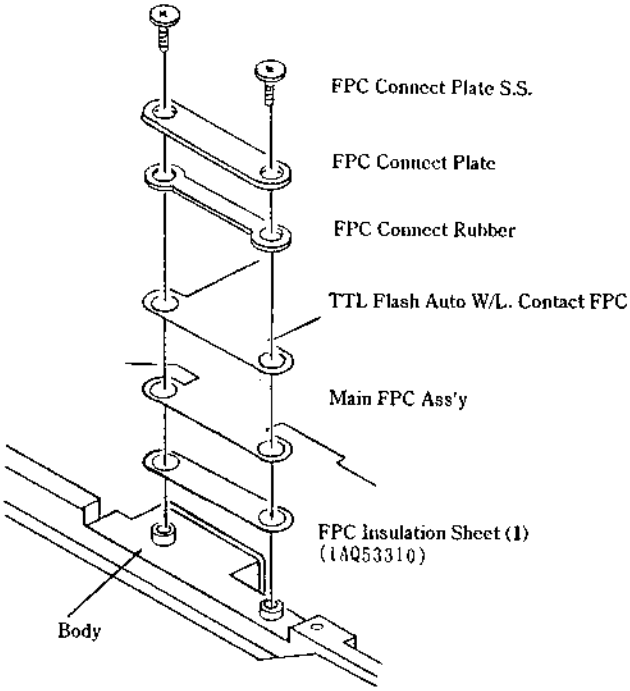
■ PARTS MODIFICATION LIST

[1] Addition of FPC Insulation Sheet (1)

In the course of production, an Insulation Sheet was added to the FPC connecting portion on the bottom of the Body in order to prevent the end face of the Main FPC from shorting to the Body.

- The FPC Insulation Sheet (1) is added between the Body and the Main FPC.
  Double-stick tape has been applied to one side of the FPC Insulation Sheet (1).
  The FPC Insulation Sheet (1) has been stuck on the back of the DX FPC.

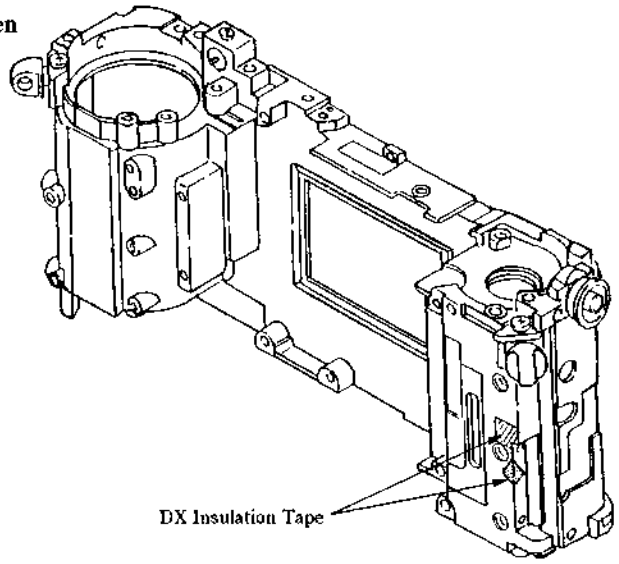
  Part Name: FPC Insulation Sheet (1)
  Part No. : 1AQ53310



[2] Modification of FPC Insulation Sheet

The following modification was made at the FPC Connecting portion on the right side of the Body in order to prevent the end face of the DX FPC from shorting to the Body.

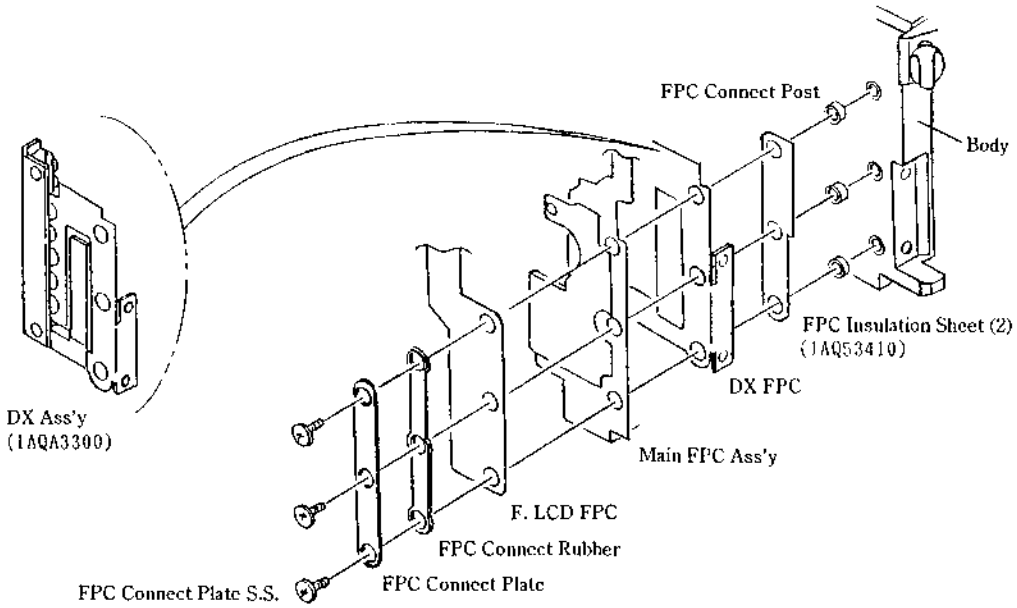
① The DX Insulation Tape has been stuck to the Body.



② The FPC Insulation Sheet (2) was added between the Body and the DX FPC and the DX Insulation Sheet was disused.
Double-stick tape has been applied to one side of the FPC Insulation Sheet (2).
The FPC Insulation Sheet (2) has been stuck on the back of the DX FPC.

Part Name : FPC Insulation Sheet (2)
Part No. : 1AQ53410

- The FPC Insulation Sheet (2) will be supplied stuck on the back of the DX FPC. That is, the DX Ass'y (1AQA3300) as a service part will be supplied incorporating the FPC Insulation Sheet (2).

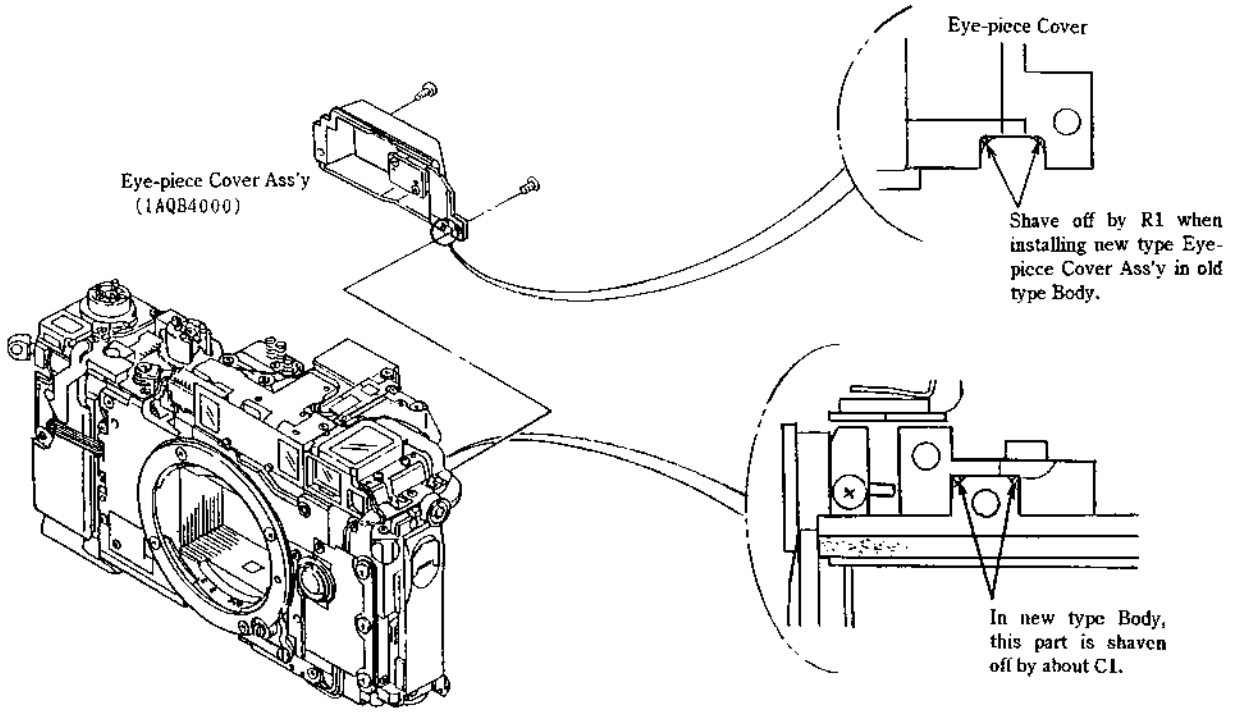


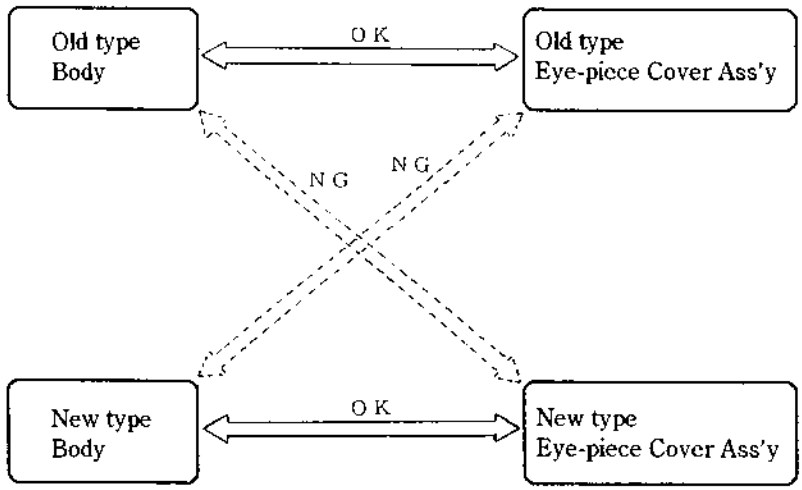
[3] Modification of Shape of Eye-piece Cover

The old type Eye-piece Cover Ass'y (1AQB4000), when installed on the Body, interfered with the Body and Finder Ass'y, thus causing a faulty operation of the FL Base Plate or a faulty parallax correction. To prevent such a trouble, the shapes of the Eye-piece Cover, Body and the Diopter Adjustment Cam Holder of the Finder Ass'y were modified.
When replacing the Eye-piece Cover Ass'y, pay attention to the following notes.

(1) Modification of Eye-piece Cover and Body

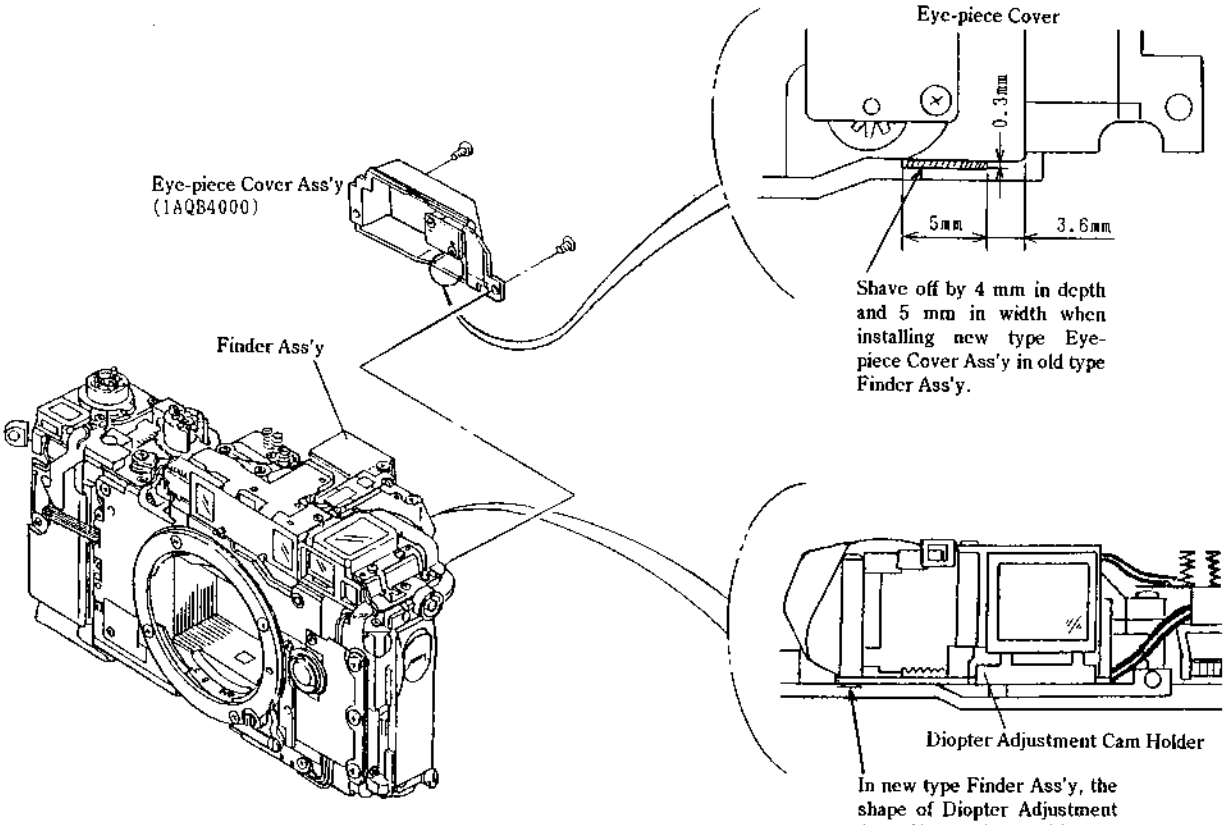
Notes: a) Take care at replacement, since there is no interchangeability.
b) No old type Eye-piece Cover Ass'y will be supplied. When installing the new type Eye-piece Cover Ass'y in the old type Body, shave off part of the Eye-piece Cover as shown below:

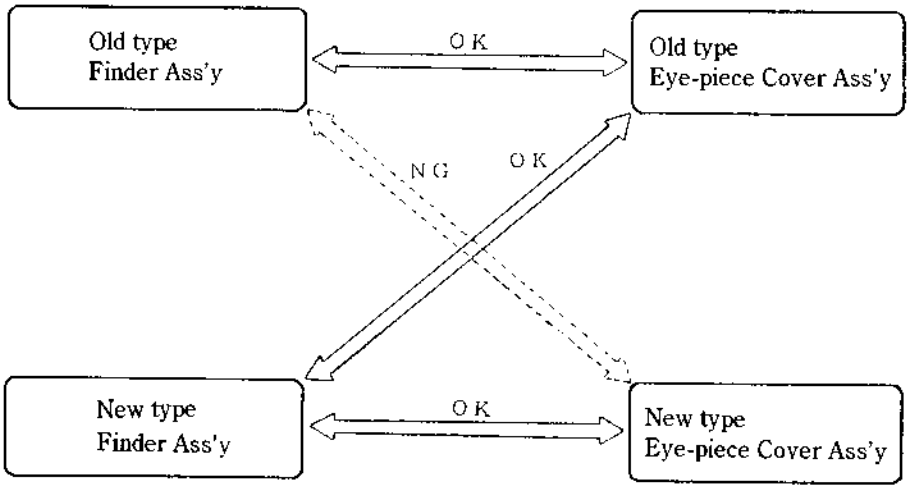

Eye-piece Cover
Eye-piece Cover Ass'y
(1AQB4000)
Shave off by R1 when installing new type Eye-piece Cover Ass'y in old type Body.
In new type Body, this part is shaven off by about C1.



(2) Modification of Eye-piece Cover and Diopter Adjustment Cam Holder of Finder Ass'y

Notes: a) Take care at replacement, since there is no interchangeability.
b) No old type Eye-piece Cover Ass'y will be supplied. When installing the new type Eye-piece Cover Ass'y in the old type Finder Ass'y, shave off part of the Eye-piece Cover as shown below:


Eye-piece Cover
0.3mm
5mm
3.6mm
Eye-piece Cover Ass'y
(1AQB4000)
Finder Ass'y
Shave off by 4 mm in depth and 5 mm in width when installing new type Eye-piece Cover Ass'y in old type Finder Ass'y.
Diopter Adjustment Cam Holder
In new type Finder Ass'y, the shape of Diopter Adjustment Cam Holder is modified so that the head of this screw does not protrude from Diopter Adjustment Cam Holder.

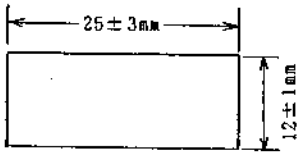


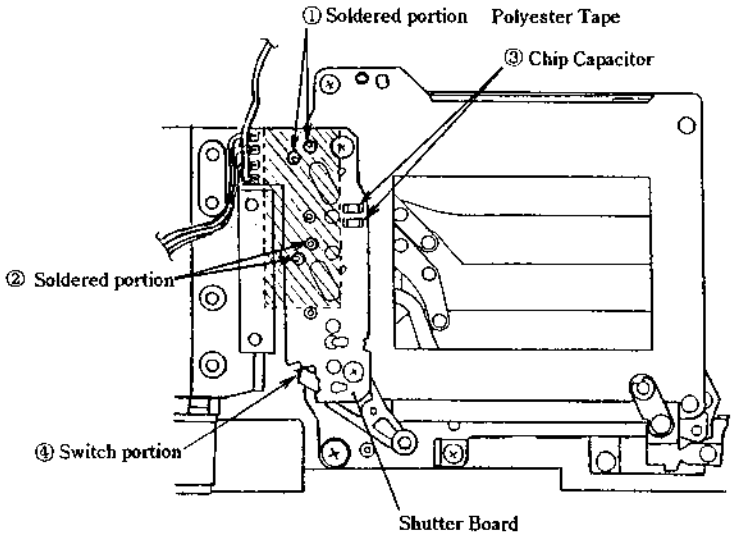
[4] Addition of Insulation Tape for Shutter Board

In the course of production, Insulation Tape (Sekisui Polyester Tape 12 mm #33) was added on the Shutter Board to prevent the soldered portions on the Shutter Board from coming in contact with the S. Set Base Plate (2) of the S. Charge Unit.

Part Name : Sekisui Polyester Tape 12 mm #33
Part No. : No part No., because this is an auxiliary material.

(Dimensions of Polyester Tape)



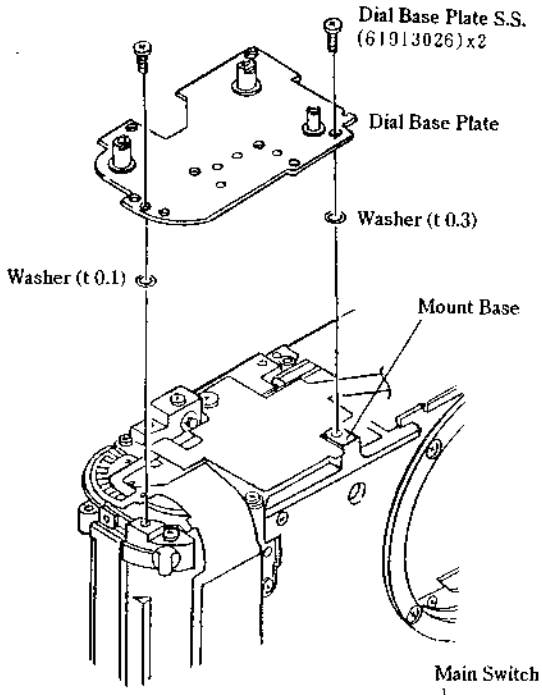


Notes: a) Stick the Insulation Tape with its edge positioned along the top edge of the Shutter Board.
b) The Insulation Tape must cover completely the soldered portions ① and ②.
c) The Insulation Tape must not cover any part of the Chip Capacitor ③.
d) The Insulation Tape must not cover any part of the Switch portion ④.

[5] Addition of Washers under Dial Base Plate

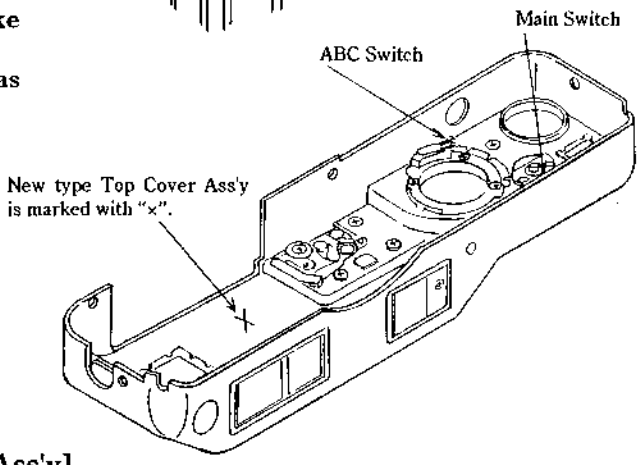
As a temporary measure against the inclination of the SH Dial, a washer "t 0.3" was added between the Dial Base Plate and the Mount Base and a washer "t 0.1" between the Dial Base Plate and the Body.
When replacing the Top Cover Ass'y, pay attention to the following notes.

As the permanent measure, the shape of the Top Cover is modified and the washers are disused.
The new type Top Cover Ass'y is marked with "×" inside (with a marking-off pin).



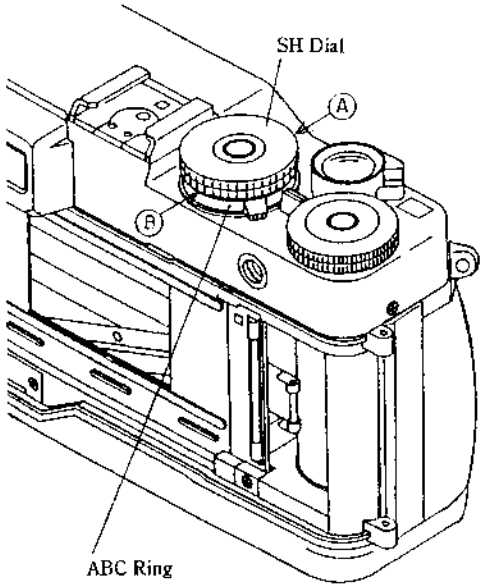
[Notes on Repair]

a) **The washers are not fixed with bond. When removing the Dial Base Plate, take care not to lose the washers.**
b) **In some cameras, the washer "t 0.3" was fixed to the Mount Base with bond.**



[Notes on Replacement of Top Cover Ass'y]

a) **When installing the new type Top Cover Ass'y, remove the washers (t 0.1 and t 0.3). Then perform the checks b) and c) below:**
b) **Check the clearance between the SH Dial and ABC Ring.**
   - **Make certain that the clearance is even at Ⓐ and Ⓑ .**
   - **Turn the SH Dial and make certain that there is no uneven turning.**
   - **Make certain that the SH Dial does not rub on the ABC Ring.**
c) **In the new type Top Cover Ass'y, the contact pressure of the Main Switch and ABC Switch is strong. After installing the Top Cover Ass'y, check the operation of each switch.**



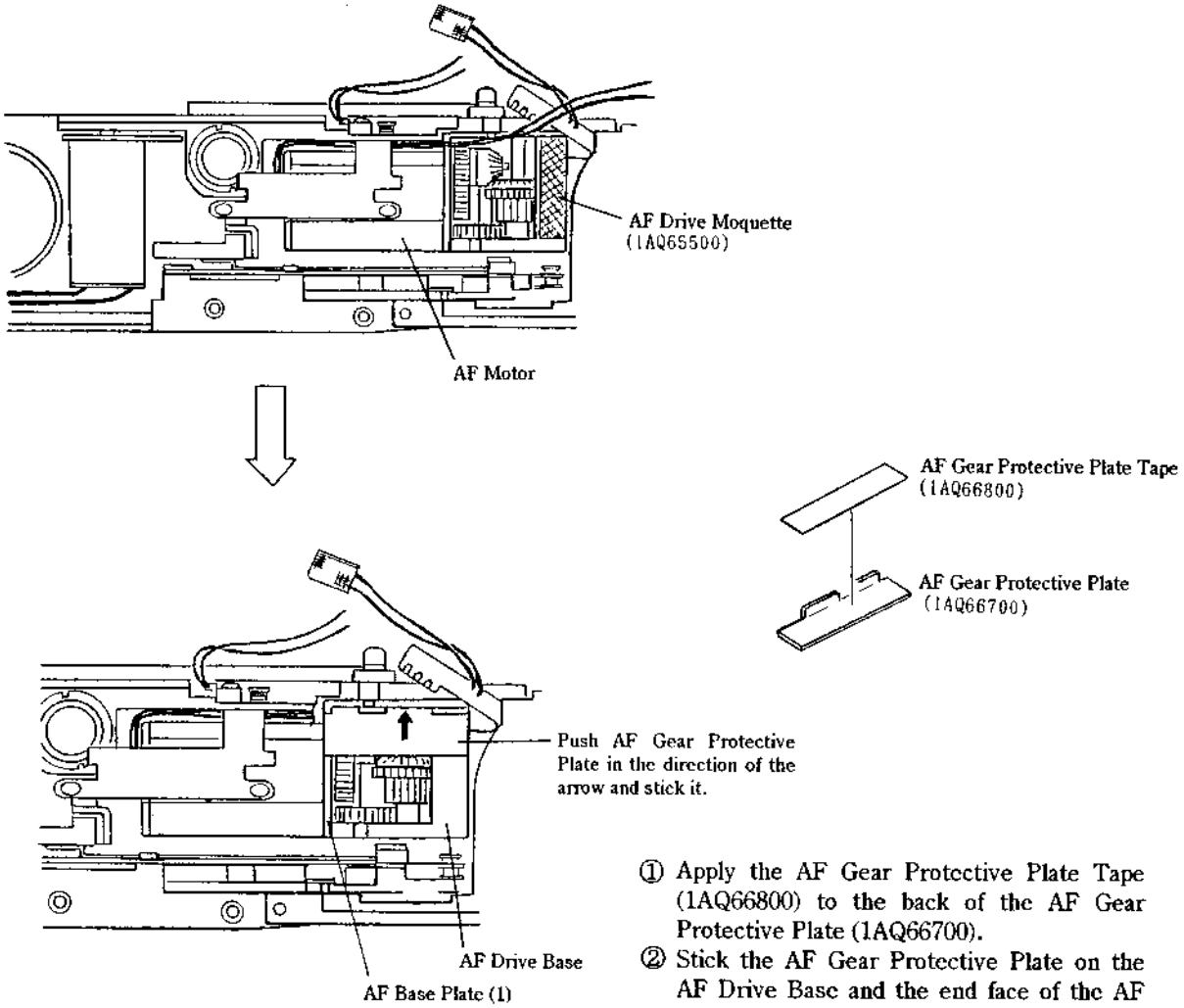
[6] Addition and Disuse of Moquette for AF Drive Ass'y

(1) There was a fear that the AF Drive Gear (2) would come in contact with the Main FPC in the lower part, thus causing a noise. To avoid such a trouble, the AF Drive Moquette (1AQ65500) was added as shown below.

Part Name : AF Drive Moquette
Part No. : 1AQ65500

(2) To improve operation efficiency, the AF Drive Moquette (1AQ65500) was disused and the AF Gear Protective Plate (1AQ66700) and AF Gear Protective Plate Tape (1AQ66800) (double-stick tape)were added instead.

Part Name : AF Gear Protective Plate
Part No. : 1AQ66700
Part Name : AF Gear Protective Plate Tape
Part No. : 1AQ66800

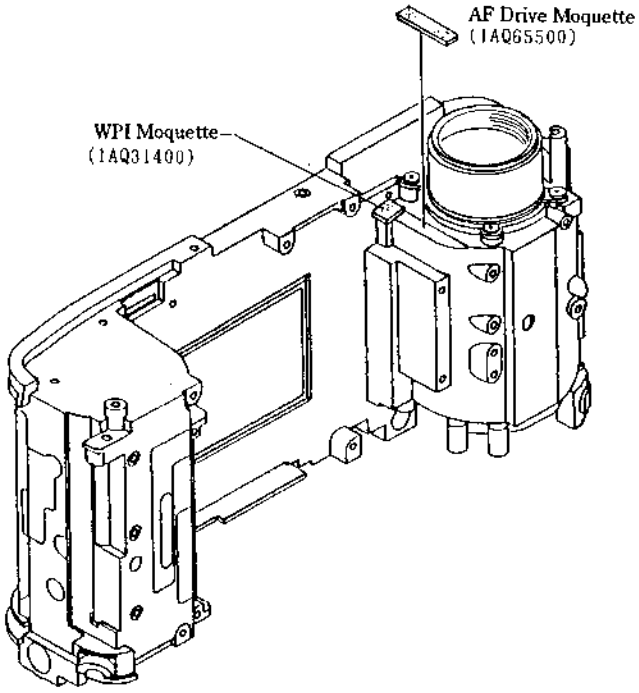


① Apply the AF Gear Protective Plate Tape (1AQ66800) to the back of the AF Gear Protective Plate (1AQ66700).
② Stick the AF Gear Protective Plate on the AF Drive Base and the end face of the AF Base Plate (1).
In doing so, push the AF Gear Protective Plate toward the base.

[7] Addition of Moquette on Bottom of Body

As shown below, Moquette was added on the bottom of the Body to prevent the vibration and resonance of the Shutter Charge Motor.

Part Name : AF Drive Moquette
Part No. : 1AQ65500



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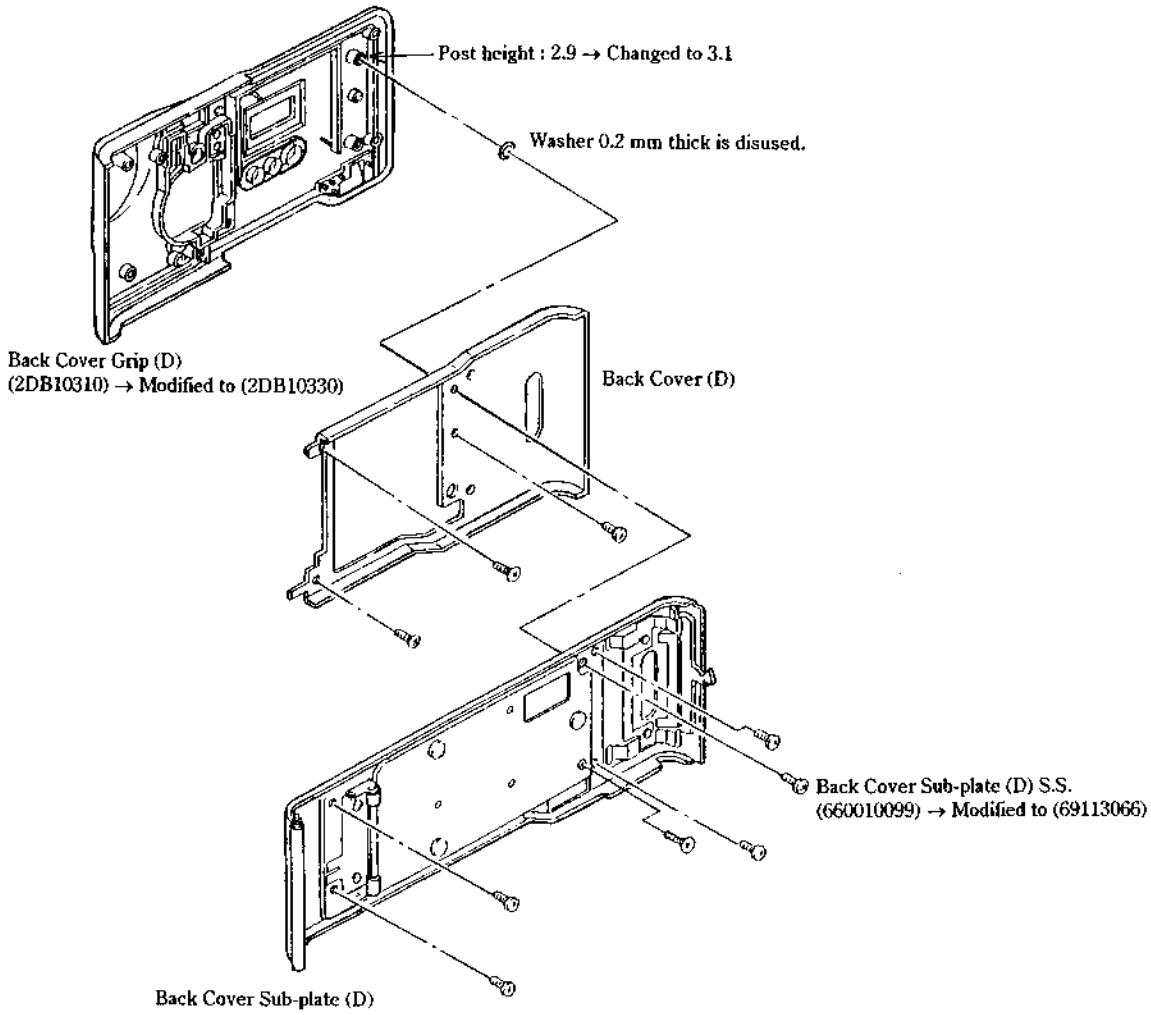
[8] Disuse of Data Back Washer

As a temporary measure, a washer of "t 0.2" was used between the Back Cover Grip (D) and the Back Cover (D). In the course of production, however, the shape of the Back Cover Grip (D) was modified and the washer was disused.
At the same time as the disuse of the washer, the Back Cover Sub-plate (D) Setscrews (66001099) was modified.

Back Cover Sub-plate (D) S.S.
66001099 (3.5 mm long) → Modified to 69113066 (3.0 mm long)

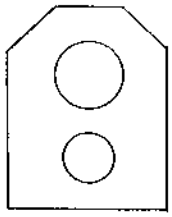
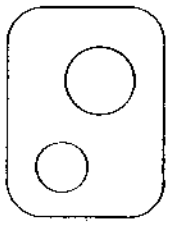
Back Cover Grip (D)
2DB10310 → Modified to 2DB10330

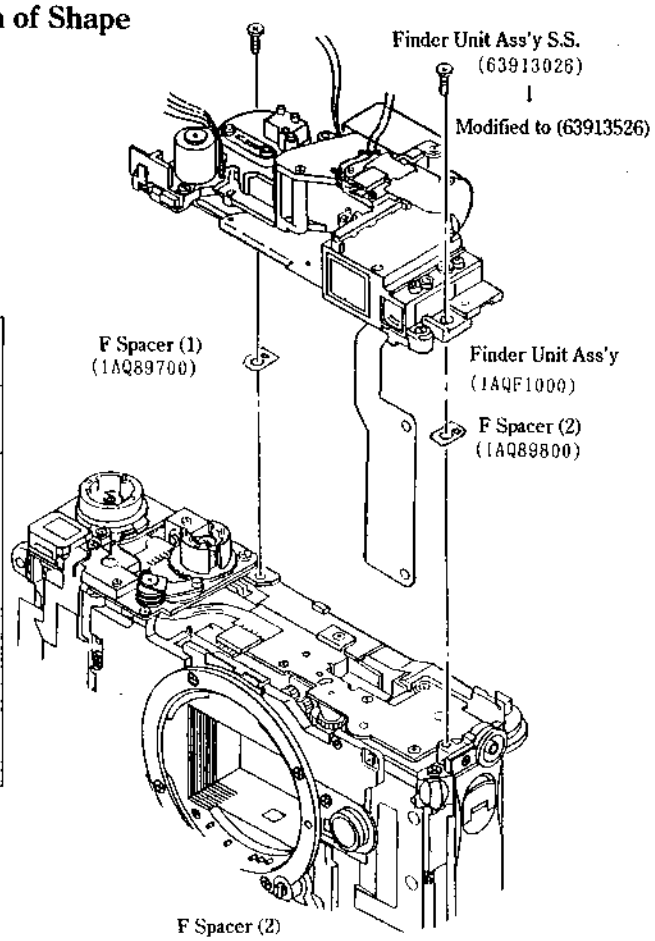

Post height : 2.9 → Changed to 3.1
Washer 0.2 mm thick is disused.
Back Cover Grip (D)
(2DB10310) → Modified to (2DB10330)
Back Cover (D)
Back Cover Sub-plate (D) S.S.
(660010099) → Modified to (69113066)
Back Cover Sub-plate (D)

No.	419-01-50-RA1AQ01

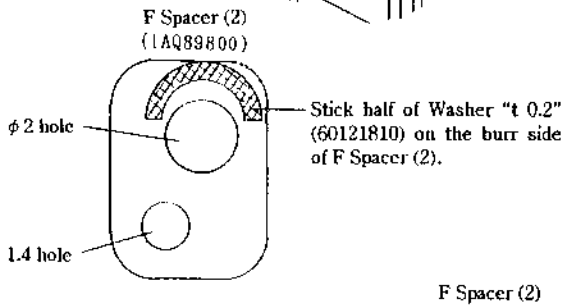
[9] Addition of F Spacers and Modification of Shape

(1) To ensure the steady mounting surface for the Finder Unit Ass'y, the F Spacer (1) (1AQ89700) and F Spacer (2) (1AQ89800) were added between the Finder Unit Ass'y and the Body. The F Spacer (1) and F Spacer (2) are fixed to the Body with bond.

Part Name	F Spacer (1)	F Spacer (2)
Part No.	1AQ89700	1AQ89800
		

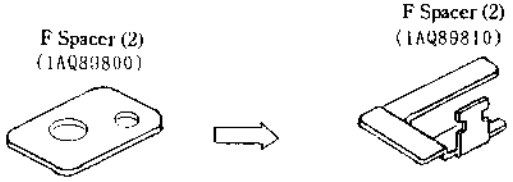


(2) Take care, since half of the Washer "t 0.2" (60121810) has been fixed to the F Spacer (2) with bond to adjust viewfinder parallax.

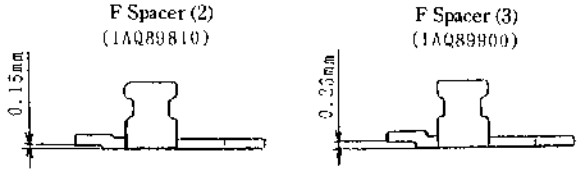


(3) In the course of production, the shape of the F Spacer (2) was modified for easy adjustment of viewfinder parallax.

Part Name : F Spacer (2)
Part No. : 1AQ89810



(4) In addition to the F Spacer (2) (1AQ89810), the F Spacer (3) (1AQ89900) is used by selection for adjusting viewfinder parallax.



(5) The length of the Finder Unit Ass'y Setscrew was modified.

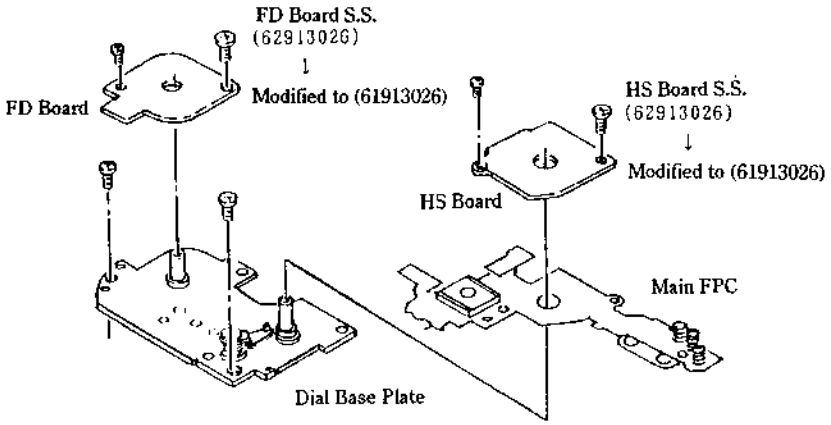
63913026 (3.0 mm long)
→ Modified to 63913526 (3.5 mm long)

[10] Modification of HS Board Setscrew and FD Board Setscrew

The HS Board Setscrew was modified to enlarge the clearance between the HS Board Setscrew (62913026) and the ABC Holder Plate, which has been too small.
At the same time, the FD Board Setscrew (62913026) was also modified to improve operation efficiency.

Part Name : HS Board S.S.
Part No. : 62913026 (Class 2) → Modified to 61913026 (Class 1)

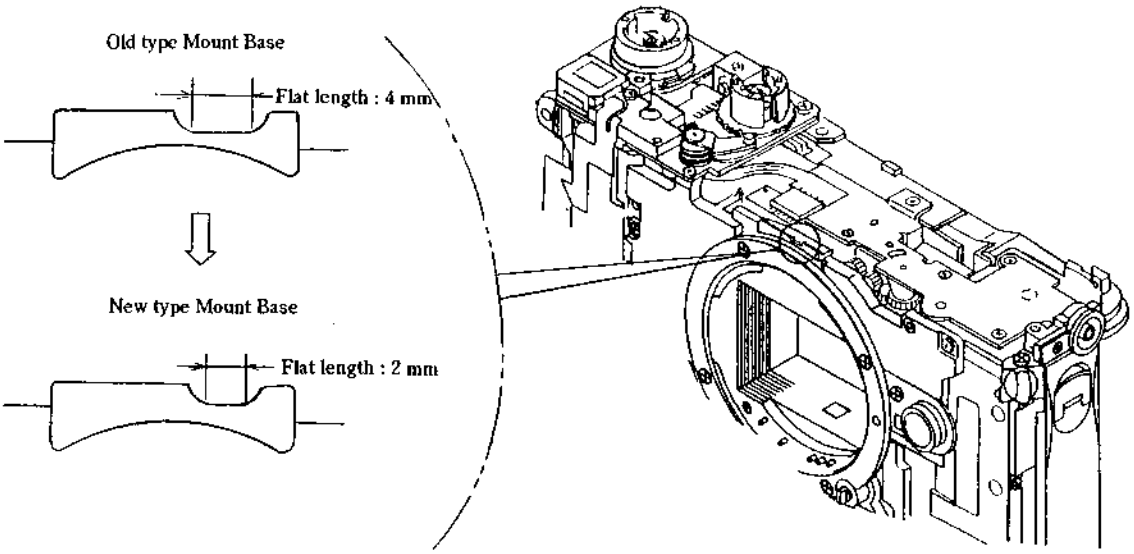
Part Name : FD Board S.S.
Part No. : 62913026 (Class 2) → Modified to 61913026 (Class 1)



[11] Modification of Shapes of Mount Base and AF Module Ass'y

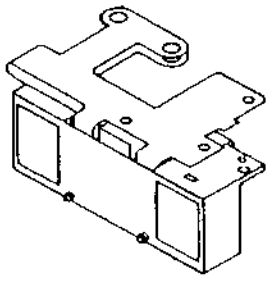
In the course of production, the shapes of the Mount Base and AF Module Ass'y were modified. Therefore, take due care when making the AF parallax adjustment.

● **Distinction between old type Mount Base and new type Mount Base**

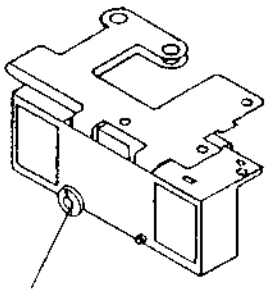


● **Distinction between old type AF Module Ass'y and new type AF Module Ass'y**

Old type AF Module Ass'y



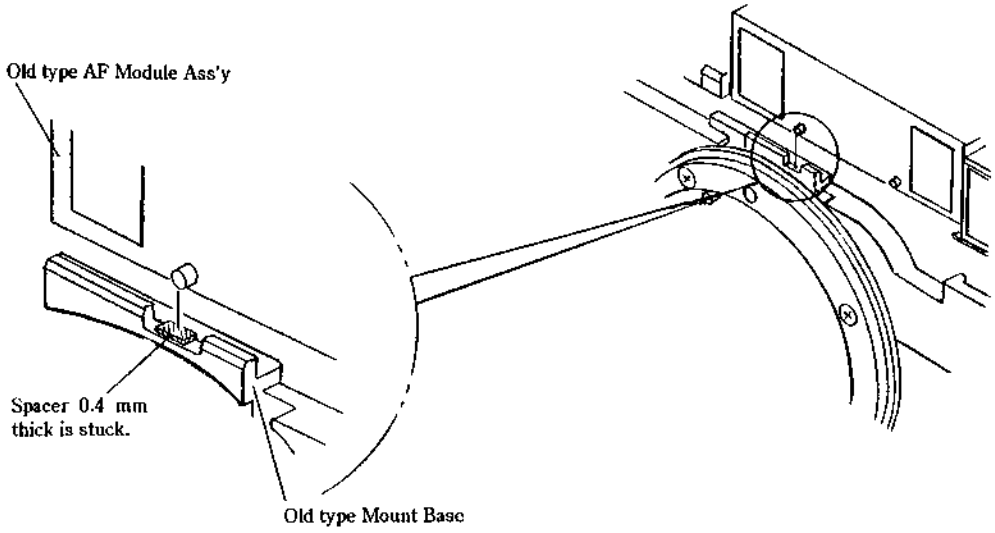
New type AF Module Ass'y



In the new type, AF Adjustment Eccentric Ring is added for AF parallax adjustment.

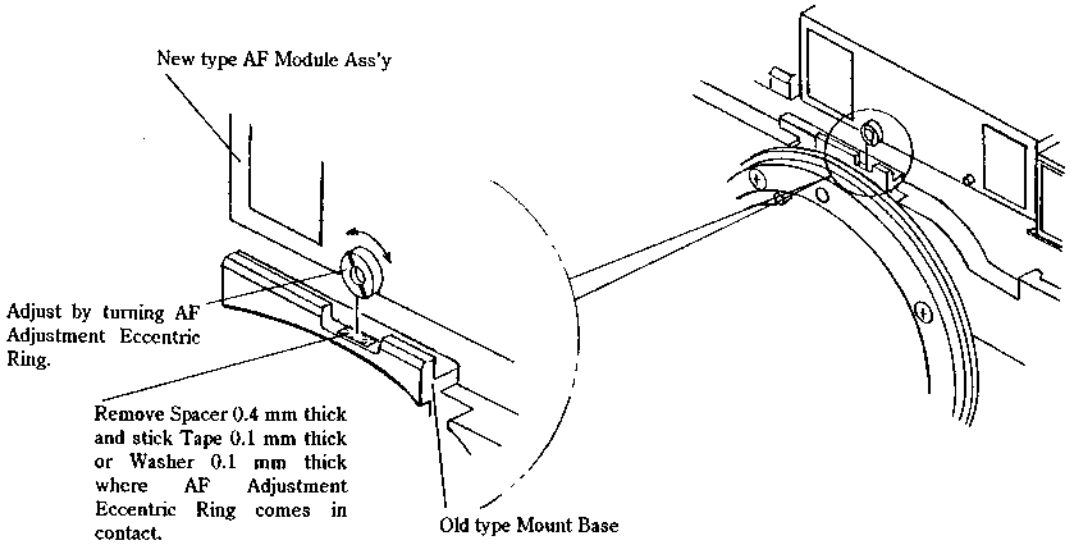
(1) AF parallax adjustment with old type Mount Base and old type AF Module Ass'y

A spacer 0.4 mm thick (used by cutting F Spacer (2) (1AQ89800)) was fixed to the Mount Base with bond in a position as shown below.
In some cameras, a washer 0.3 mm thick was fixed to the Mount Base with bond as required for the AF parallax adjustment.



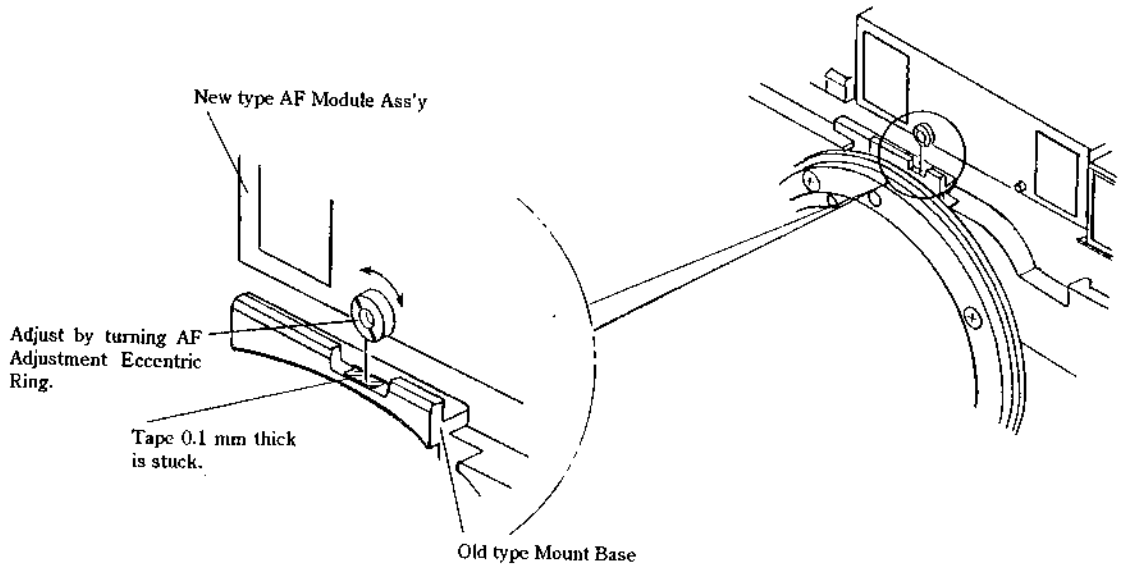
● **Installation of new type AF Module Ass'y on old type Mount Base**

Remove the spacer 0.4 mm thick that is stuck on the Mount Base with bond. Then stick a washer 0.1 mm thick or a piece of tape 0.1 mm thick on the Mount Base where the AF Adjustment Eccentric Ring comes in contact.
After that, make the AF parallax adjustment by turning the AF Adjustment Eccentric Ring.


New type AF Module Ass'y
Adjust by turning AF Adjustment Eccentric Ring.
Remove Spacer 0.4 mm thick and stick Tape 0.1 mm thick or Washer 0.1 mm thick where AF Adjustment Eccentric Ring comes in contact.
Old type Mount Base

(2) AF parallax adjustment with old type Mount Base and new type AF Module Ass'y

A piece of tape 0.1 mm thick is stuck on the Mount Base with bond and the AF parallax adjustment is made by turning the AF Adjustment Eccentric Ring.

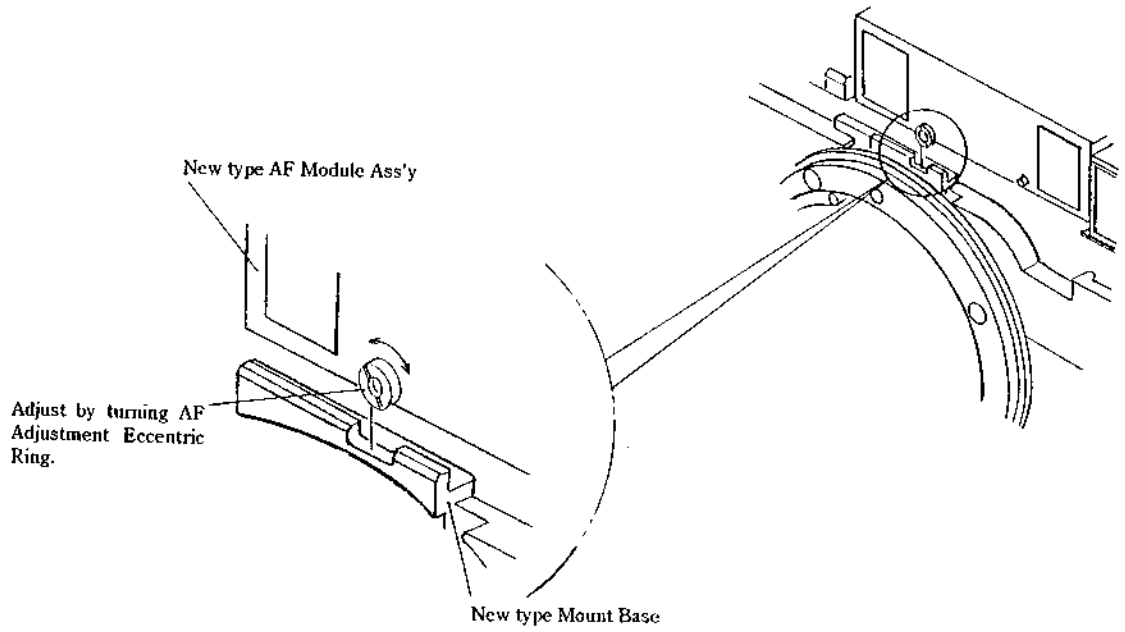


(3) AF parallax adjustment with new type Mount Base and new type AF Module Ass'y

The AF parallax adjustment is made by turning the AF Adjustment Eccentric Ring.

Notes: a) When making the adjustment with the AF Adjustment Eccentric Ring, loosen slightly the AF Module Ass'y Setscrews (69113076)×2 beforehand. After the adjustment, tighten up the AF Module Ass'y Setscrews.

b) Instead of tightening up the AF Module Ass'y Setscrews, fix the AF Adjustment Eccentric Ring with the bond (Cemedine 551) after the adjustment.



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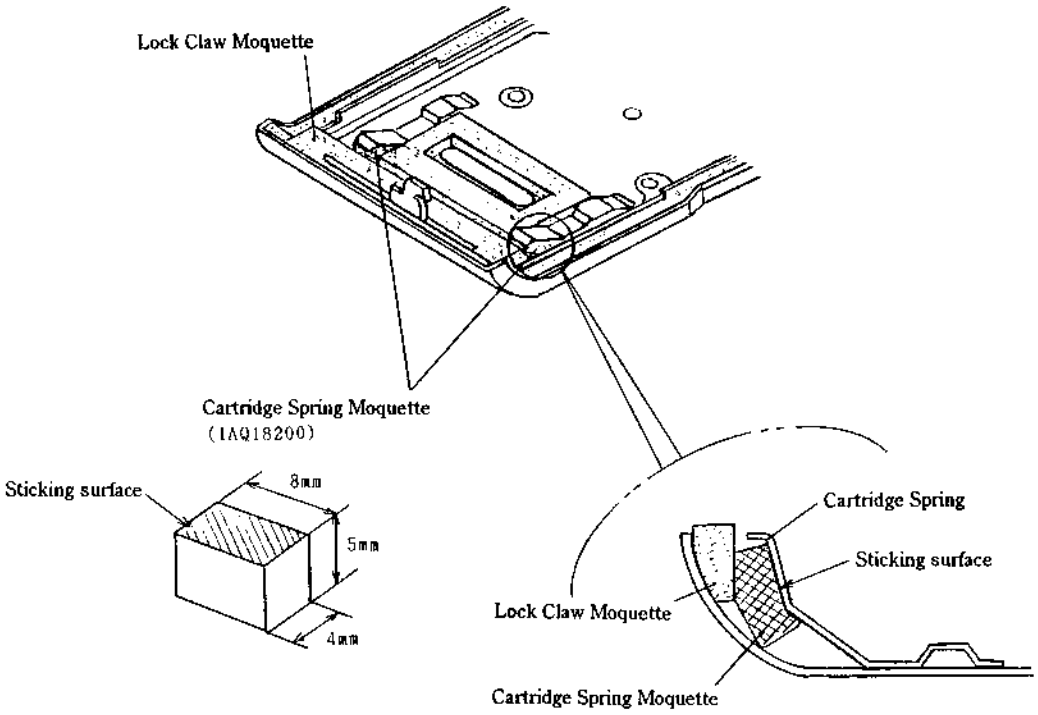
[12] Addition of Cartridge Spring Moquette

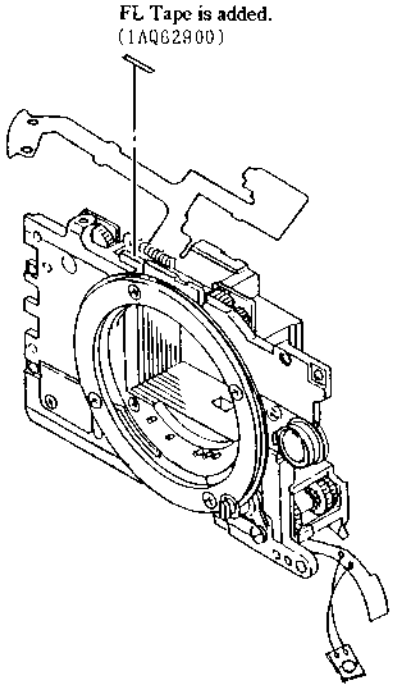
To strengthen the contact pressure between the DX Ass'y and the DX Pin, the Cartridge Spring Moquettes (1AQ18200)×2 were added under the Cartridge Springs of the Back Cover Ass'y and Data Back Ass'y.



[13] Addition of FL Tape

When the Finder Ass'y was installed, the Finder Base was pushed and so deformed that the normal operation of the F. Cam Plate was obstructed and the angle of view of the viewfinder sometimes did not agree with the angle of view of the mounted lens. To prevent this trouble, the FL Tape (1AQ62900) (aluminum tape with adhesives on its one side) was added.

Part Name : FL Tape
Part No. : 1AQ62900

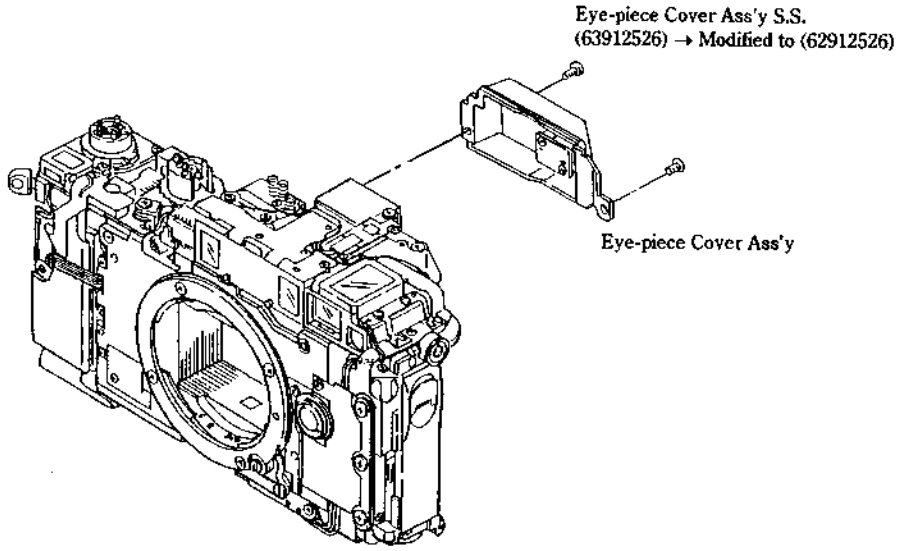


No.	419-01-50-RA1AQ01

[14] Modification of Eye-piece Cover Ass'y Setscrew

The Eye-piece Cover Ass'y Setscrew was modified to prevent the flange of the Eye-piece Cover Ass'y Setscrew (63912526) from coming in contact with the Top Cover Ass'y.

Part Name : Eye-piece Cover Ass'y S.S.
Part No. : 63912526 (Class 3) → 62912526 (Class 2)



C. ADJUSTMENT PROCEDURES, ETC.

C-1 ADJUSTMENT OF FLANGE BACK

C-1-1. Adjustment of Flange Back

① Distance from the Body Mount surface to the film rail surface:

28.95 ± 0.02 mm

For the adjustment, insert appropriate washers between the Body Mount and the Mount Base.

Adjusting washers : 0.05 mm (12866600), 0.02 mm (12866700)

② Level difference between the film rail surface and the pressure plate rail surface:

0.2 ± 0.02 mm

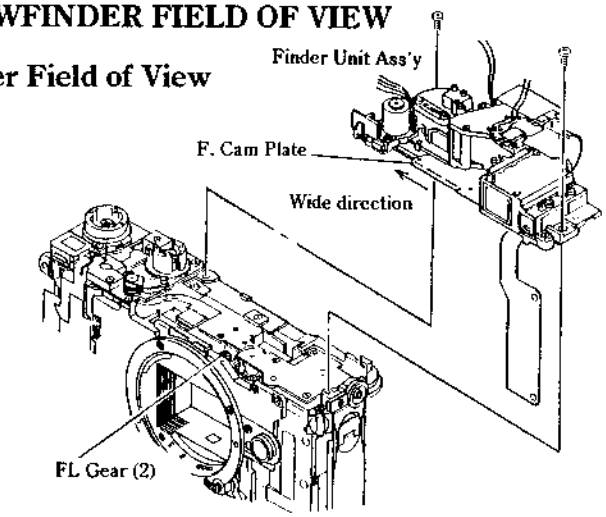
C-2. CHECK AND ADJUSTMENT OF VIEWFINDER FIELD OF VIEW

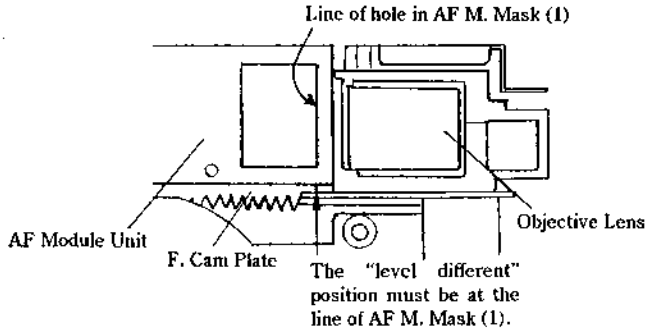
C-2-1. Check and Adjustment of Viewfinder Field of View

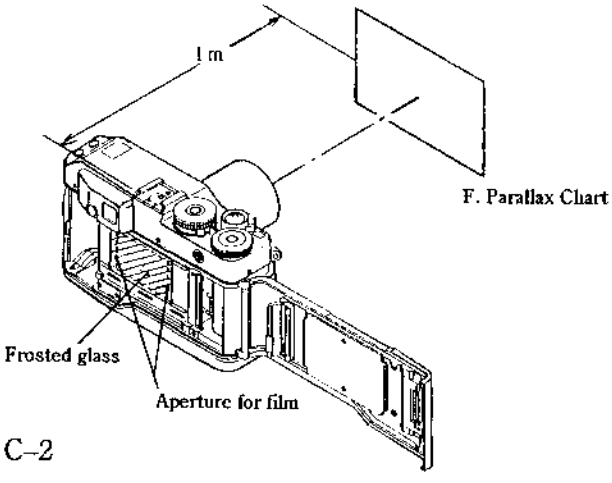
Note: Once the Finder Unit Ass'y has been removed, check and adjust the viewfinder field of view.

* Before installing the Top Cover Ass'y, perform the checks 1) to 4) :

1) Install the Finder Unit Ass'y by setting it to the fully Wide side. Then make certain that there is a play in the engagement between the F. Cam Plate on the bottom of the Finder Unit Ass'y and the FL Gear (2) of the FL Base Plate.
2) If there is no play, change the engagement between the FL Cam Plate and the FL Gear (2) by one tooth to produce a play.
3) Set the lens "Sonnar f 2.8/90" on the Body Mount.
4) Look at the front of the camera and make certain that the F. Cam Plate is positioned as shown at right.
5) Fix the F. Parallax Chart on the wall.
6) Install the Top Cover Ass'y, Shutter Dial and Focus Dial temporarily.
7) Mount the camera on the tripod.
8) Open the Back Cover and stick the frosted glass to the film rail surface.
9) Set the camera mounted on the tripod so that the optical axis of the camera is perpendicular to the F. Parallax Chart and the distance from the F. Parallax Chart to the Distance Reference Index of the camera (see page C-6) is 1 m.
10) Set the Shutter Dial of the camera to "B" and the Focus Dial to "1 m".

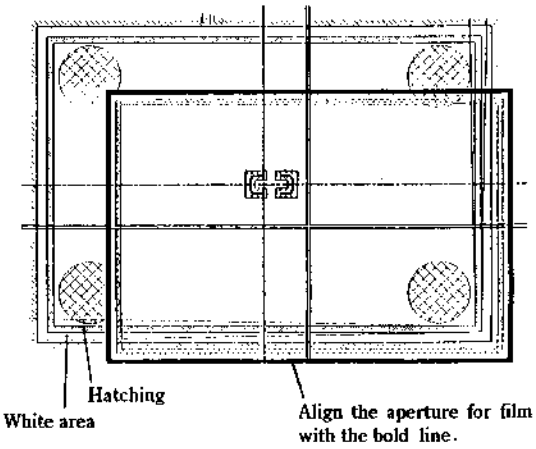



Line of hole in AF M. Mask (1)
AF Module Unit
F. Cam Plate
Objective Lens
The "level different" position must be at the line of AF M. Mask (1).



11) Set the aperture of the lens to "fully open" (F2.8).
12) Turn ON the Main Switch.
13) Open the shutter by pressing the Shutter Release Button. In this state, while looking at the frosted glass, align the aperture for the film with the black bold line of the F. Parallax Chart.
14) Turn OFF the Main Switch.
15) Look in the viewfinder and make certain that the field-of-view frame is positioned within the peripheral white area of the F. Parallax Chart outside the hatching areas.

(F. Parallax Chart)



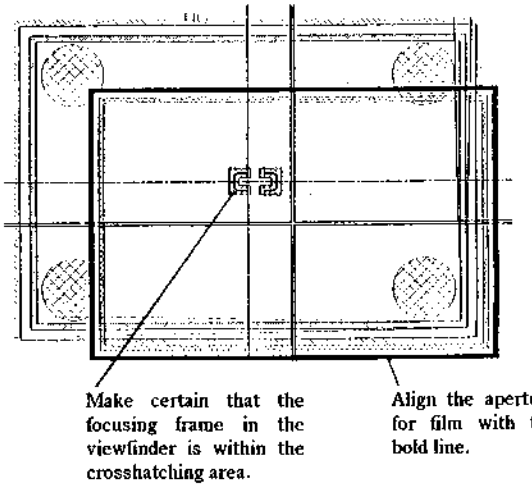
C-3. CHECK AND ADJUSTMENT OF VIEWFINDER PARALLAX

C-3-1. Check of Viewfinder Parallax

Note: Once the Finder Unit Ass'y has been removed, check the viewfinder parallax.

1) Fix the F. Parallax Chart on the wall.
2) Open the Back Cover and fix the frosted glass to the film rail surface.
3) Set the lens "Sonnar f 2.8/90" on the Body Mount and mount the camera on the tripod.
4) Set the camera mounted on the tripod so that the optical axis of the camera is perpendicular to the F. Parallax Chart and the distance from the F. Parallax Chart to the Distance Reference Index of the camera (see page C-6) is 1 m.
5) Set the Shutter Dial of the camera to "B" and the Focus Dial to "1 m".
6) Set the aperture of the lens to "fully open" (F2.8).

(F. Parallax Chart)

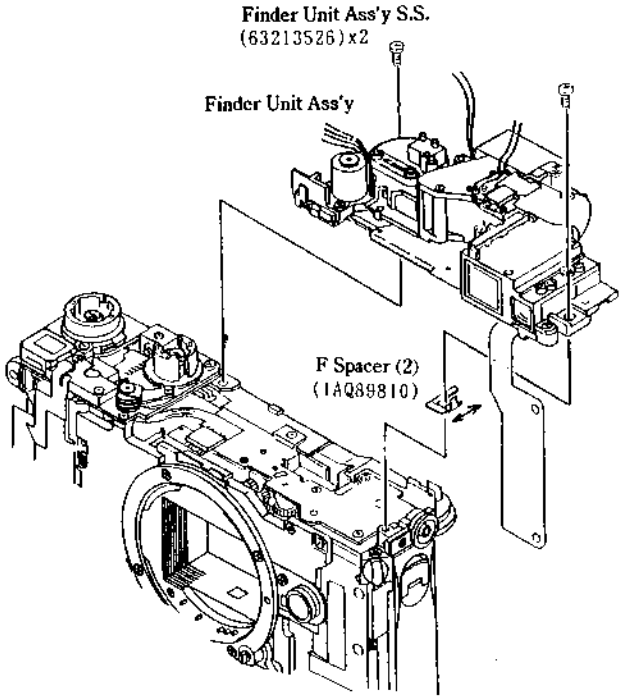

Make certain that the focusing frame in the viewfinder is within the crosshatching area.
Align the aperture for film with the bold line.

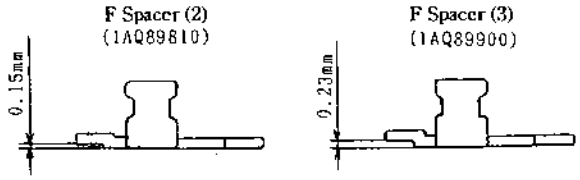
7) Turn ON the Main Switch.
8) Open the shutter by pressing the Shutter Release Button. In this state, while looking at the frosted glass, align the aperture for the film with the black bold line of the F. Parallax Chart.
9) Turn OFF the Main Switch.
10) Look in the viewfinder and make certain that the focusing frame at the center of the viewfinder is positioned within the crosshatching area of the F. Parallax Chart.
11) If parallax is found faulty, follow the procedures instructed in C-3-2 or C-3-3.

C-3-2. Fine Adjustment of Viewfinder Parallax

Notes: a) Make this adjustment with the Top Cover Ass'y removed.
b) Make this adjustment when the focusing frame is found below the hatching area of the chart. (Adjustment of vertical position)
c) Make the adjustment as instructed in C-3-3 when the focusing frame is found dislocated laterally (dislocated horizontally) or slanting.

1) Follow steps 1) to 6) of C-3-1.
2) Loosen slightly the Finder Unit Ass'y Setscrews (63213526)×2.
3) Cause a short circuit by a bridge with solder on the pattern of the Main FPC Ass'y. (See Fig. 3)
4) Open the shutter by pressing the Shutter Release Switch. In this state, while looking at the frosted glass, align the aperture for the film with the black bold line of the F. Parallax Chart.
5) Remove the bridge with solder on the pattern of the Main FPC Ass'y.
6) Look in the viewfinder and adjust by moving the F Spacer (2) (1AQ89810) back and forth so that the focusing frame at the center of the viewfinder is positioned within the crosshatching area of the F. Parallax Chart.
7) When the adjustment at step 6) is not effective, replace the F Spacer (2) (1AQ89810) with the F Spacer (3) (1AQ89900) and adjust by moving the F Spacer (3) back and forth.
8) Tighten up the Finder Unit Ass'y Setscrews (63213526)×2.
9) If this fine adjustment is not effective, make the adjustment of C-3-3. However, the adjustment of C-3-3 is allowed only when the optical system in the Finder Unit Ass'y has not been disassembled.





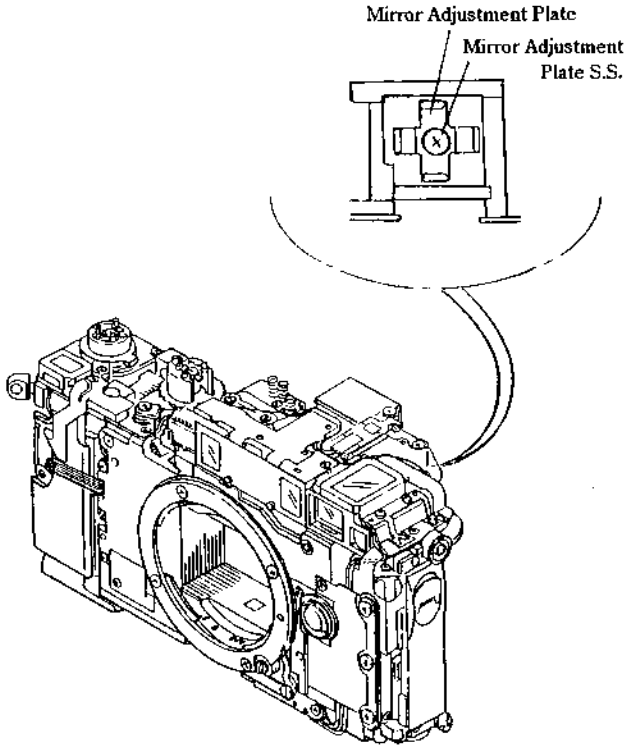
C-3-3. Adjustment of Viewfinder Parallax

Notes: a) Make this adjustment to correct a faulty parallax due to a lateral (horizontal) dislocation or slant.
b) Make this adjustment when the Finder Unit Ass'y has been replaced. After this adjustment, make the adjustment of C-3-2.

1) Follow steps 1) to 6) of C-3-1.
2) Apply ketone to the Mirror Adjustment Plate and the Mirror Adjustment Plate Setscrew to soften the bond (Cemedine 551).

Note: Do not loosen the Mirror Adjustment Plate Setscrew.

3) Cause a short circuit by a bridge with solder on the pattern of the Main FPC Ass'y. (See Fig. 3)
4) Open the shutter by pressing the Shutter Release Switch. In this state, while looking at the frosted glass, align the aperture for the film with the black bold line of the F. Parallax Chart.



5) Remove the bridge with solder on the pattern of the Main FPC Ass'y.
6) Correct the horizontal position and slant of the frame by moving the Mirror Adjustment Plate up and down or right and left.
7) After adjustment, apply the bond to the Mirror Adjustment Plate and the Setscrew.

C-4. CHECK AND ADJUSTMENT OF AF MODULE PARALLAX

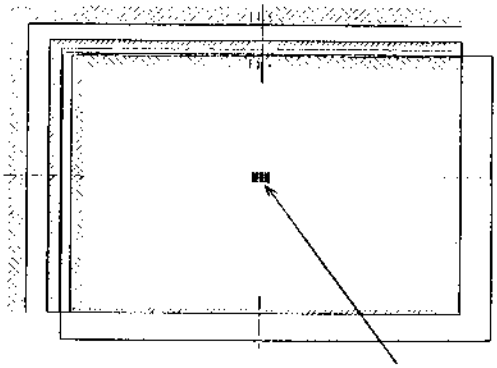
C-4-1. Check and Adjustment of AF Module Parallax

Notes: a) Check the focus display to prevent the variance between the distance through the focusing frame in the viewfinder and the distance measured by the AF Module.
b) Perform this check with the Top Cover Ass'y installed.

1) Fix the F. Parallax AF Chart on the wall.
2) Set the lens "Planar f 2/45" on the Body Mount and mount the camera on the tripod.
3) Set the camera mounted on the tripod so that the optical axis of the camera is perpendicular to the F. Parallax Chart and the distance from the F. Parallax Chart to the Distance Reference Index of the camera is 1 m.
4) Set the Focus Dial of the camera body in a position of manual focusing. (Set to any distance.)
5) While looking in the viewfinder, adjust the camera position so that the "zebra" mark at the center of the F. Parallax AF Chart is seen within the right half of the focusing frame.
6) Turn ON the Main Switch and check to see if the "distance metering impossible" display appears.
7) While looking in the viewfinder, adjust the camera position so that the "zebra" mark at the center of the F. Parallax AF Chart is seen within the left half of the focusing frame.
8) Check to see if the "distance metering impossible" display appears.
9) The AF Module parallax is considered acceptable when the "distance metering impossible" display does not appear at steps 6) nor 8).
10) If the "distance metering impossible" display appears at step 6) or 8), follow the procedures as instructed at step 11):
11) Remove the Top Cover Ass'y and turn the AF Adjustment Eccentric Ring of the AF Module. Then repeat steps 5) to 9).

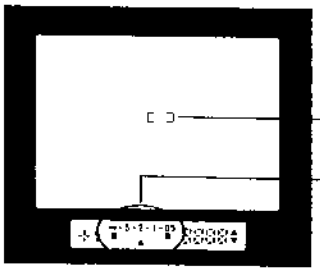
Note: Take care, since the AF Adjustment Eccentric Ring is fixed with the bond (Cemedine 551).
After adjustment, fix the AF Adjustment Eccentric Ring with the bond.

(F. Parallax AF Chart)



"Zebra" mark of F. Parallax AF Chart

(Viewfinder Display)

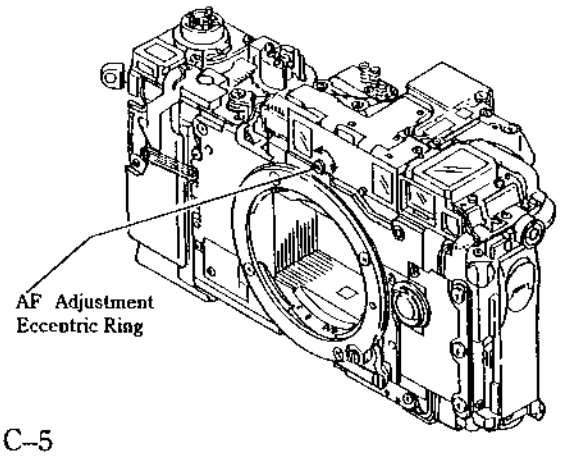


Focusing frame in viewfinder

"Distance metering impossible" display

Position the "zebra" mark of F. Parallax AF Chart within the left half of the focusing frame.

Position the "zebra" mark of F. Parallax AF Chart within the right half of the focusing frame.

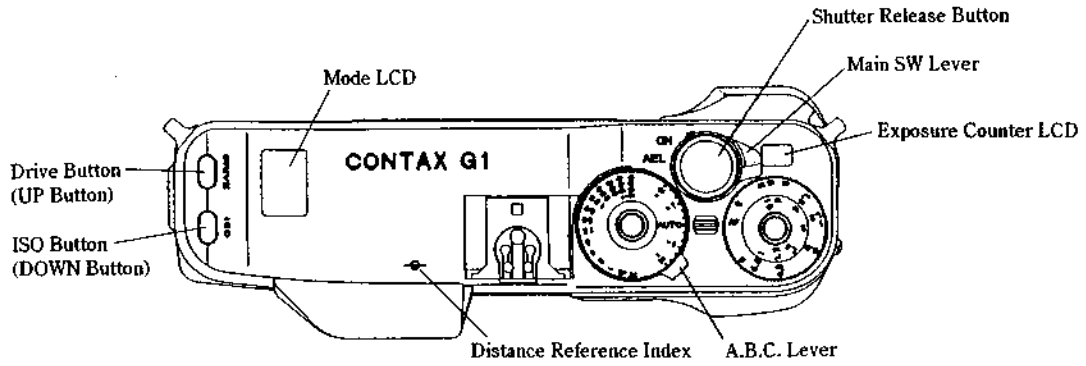


AF Adjustment Eccentric Ring

C-5. ADJUSTMENTS OF COMPENSATION VALUES (MANUAL ADJUSTMENTS)

This camera permits the adjustments of compensation values (adjusted values) by its manual operation only. Therefore, adjustments can be made without communication with any special adjusting tools.

C-5-1. Manual Adjustments and Data Change



[Outline of Manual Adjusting Mode]

The following functions are available in manual adjusting mode:
- Checking and change of memory data (adjusted values) of camera
- Display of data necessary for adjustment, such as light metering values, distance metering values and voltage values for the dial resistor
- Checking of shots count

There are three modes for manual adjustments.
Mode Ⅰ, Ⅱ or Ⅲ is selected according to the setting position of the A.B.C. Lever.

- **ABC/OFF = Mode Ⅰ : Main adjusted values**
- ABC/± 0.5 = Mode Ⅱ : Particular data of lens
- **ABC/±1.0 = Mode Ⅲ : Fixed data and adjusted values (partially the same as Mode Ⅰ)**

In addition to data change, Mode Ⅰ allows operations necessary for adjustments, such as release operation, display of a light metering value, display of a distance metering value and voltage display of a dial setting position.

Modes Ⅱ or Ⅲ allow only the operations for data display and data change. Make all the necessary adjustments in Mode Ⅰ.

Note: Never change the data displayed in Mode Ⅱ.

[Operation Switches for Manual Adjustments]

- Main SW Lever
  - OFF : Completion of manual adjustment. Same as Main Switch OFF in normal operation
  - ON : Mode for selecting an adjusted value item
  - AE Lock : Adjusted value change mode

- A.B.C. Lever
  Use this lever to select a manual adjusting mode.

• Back Cover
Use the Back Cover in combination with the Manual Rewind Button to set manual adjusting mode.
At the "open → close" of the Back Cover, will complete to manual adjusting mode and returns to the normal operation mode.

• Manual Rewind Button
Use this button in combination with the Back Cover to set manual adjusting mode.

• Shutter Release Button
Use this button to store data in Mode Ⅰ, Ⅱ and Ⅲ.
Also use this button to select a lens model in Mode Ⅱ.

• Drive Button (UP Button)
Use this button to change the adjustment item (kind) with the Main Switch in the "ON" position.
Use this button to change the adjusted value with the Main Switch in the "AE Lock" position.

The Drive Button increases the displayed value.

• ISO Button (DOWN Button)
Use this button to change the adjustment item (kind) with the Main Switch in the "ON" position.
Use this button to change the adjusted value with the Main Switch in the "AE Lock" position.

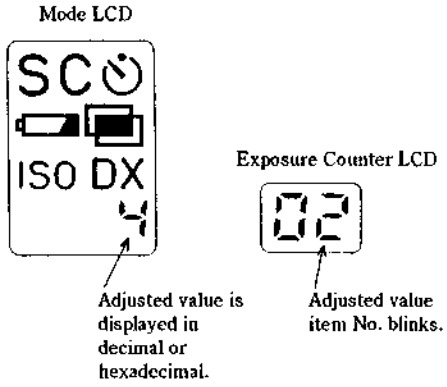
The ISO Button decreases the displayed value.

[Display of Adjusting Mode : Mode Ⅰ]

The Mode LCD and Exposure Counter LCD are used for display.

• Mode LCD
When the camera enters manual adjusting mode, all the characters on the Mode LCD light up. A selected adjusted value is displayed at the indicator that displays a film speed or shooting distance in the normal operation.

• Exposure Counter LCD
This LCD blinks, displaying the item No. of the adjusted value.



[How to Change Adjusted Value]

Change the data by the following procedure :
1. Set a manual adjusting mode.
2. Select the item for an adjusted value to be changed.
3. Change the adjusted value.
4. Store the adjusted value.
5. Complete manual adjusting mode.

1. Setting of Manual Adjusting Mode

Use the following operation switches to set manual adjusting mode:
Main Switch, Back Cover, Manual Rewind Button, Shutter Release Button

1) Set the Main Switch to "ON".

Note : You can not set manual adjusting mode if the Main Switch is in the "OFF" position.
Even when the Main Switch is in the "AE Lock" position, you can set a manual adjusting mode. However,it is the data change mode.
Be sure to set the Main Switch in the "ON" position beforehand when selecting a data item.

2) Open the Back Cover.
3) Press the Manual Rewind Button and within 2 seconds, while keeping it pressed, press the Shutter Release Button (all the way) more than one second.

At transition to manual adjusting mode, all the displays on the Mode LCD light up.

After setting of manual adjusting mode, turn OFF the Manual Rewind Button Switch.
After that, the camera will be kept in manual adjusting mode unless the Main Switch is turned OFF or the Back Cover is closed. The "auto power OFF" function does not work.

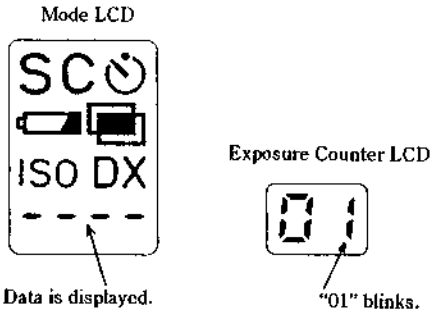
2. Selection of Item for Adjusted Value to be Changed (Address Change)

Use the following operation switches to select an adjustment item :
A.B.C. Lever, Drive Button, ISO Button

1) Select Mode I by setting the A.B.C. Lever in the "ABC/OFF" position.

The display on the Exposure Counter LCD blinks, displaying "01".
The data display on the Mode LCD becomes "----".

The number displayed on the Exposure Counter LCD represents the adjustment item No. The number at the data display position on the Mode LCD represents the current adjusted value.



* The relationship between the item Nos. and the adjustment items is shown in the "Table of Mode Items". (See page C-10)

2) Select an item No. by pressing the UP Button (Drive Button).
When the item No. changes, the data on the Mode LCD also changes according to the item.

Reference : The blinking display can be changed by operating the UP (Drive)/DOWN (ISO) Button.
In the case above, the item No. for an adjusted value can be changed, since the counter display is blinking.

3. Change of Adjusted Value (Data Change)

Use the following switches to change an adjusted value :
Main Switch, Drive Button (UP Button), ISO Button (DOWN Button)

1) Set the adjusted value change mode by setting the Main Switch to "AE Lock".
The counter changes from blinking to lighting up and the data display on the Mode LCD starts blinking.

Reference : Operations according to the Main Switch position are as follows :

OFF	: Completion of test mode. Return to the normal "Main OFF" operation
ON	: Selection of adjusted value item NO. (Counter blinking)
AE Lock	: Change of adjusted value (Data display on Mode LCD blinking)

2) Change the data by pressing the UP Button (Drive Button) or DOWN Button (ISO Button).

Reference : When an item for camera operation has been selected, the displayed data is not an adjusted value and thus it does not change.

3) Restore the mode for changing the adjusted value item No. by returning the Main Switch to "ON".

Note : In this stage, the changed data is not stored in memory. Therefore, the changed data will be deleted if the Main Switch is turned OFF at this point.

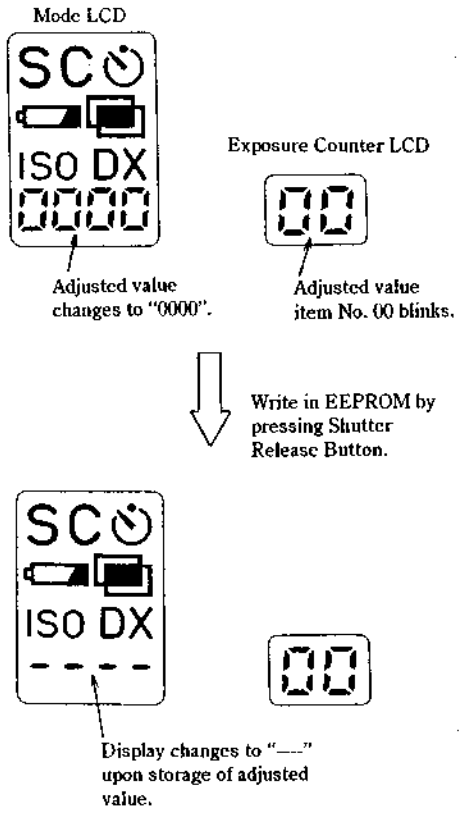
4. Storage of Adjusted Value (Writing in EEPROM)

Use the following switches to store an adjusted value :
Main Switch, Drive Button (UP Button), ISO Button (DOWN Button)

1) Set the adjusted value item No. to "00" by pressing the ISO Button (DOWN Button).

Note : Take care, since the adjusted value can change if the operation of 3-3) has not been performed.

2) Store the data in memory by pressing the Shutter Release Button. Upon completion of data storage, the data display on the Mode LCD changes to "----".



5. Completion of Manual Adjusting Mode

Complete manual adjusting mode by turning OFF the Main Switch and closing the Back Cover.

* See other sections for how to determine an adjusted value.
See C-5-2 ~ C-5-8.

[Table of Mode I Items]

Item No. (Hex.)	Adjustment Name	Data Display External LCD	Main-ON State	Main-AEL State	Release Switch OFF → ON	Remark
00	Storage of adjusted value	0000	Item change by DRIVE, ISO		Write in ROM	
01	Not used	----	Item change by DRIVE, ISO		No change	
02	Shutter time adjustment	Dec.	Item change by DRIVE, ISO	Data change by DRIVE, ISO	Normal shutter operation	
03	TTL Flash Auto adjustment	Dec.				
04	TTL light exposure adjustment 1	Dec.				Lv15
05	TTL light exposure adjustment 2	Dec.				Lv 8
06	External light exposure adjustment 1	Dec.				Lv15
07	External light exposure adjustment 2	Dec.				Lv 8
08	Shots counter (Inferior-order 4 digits)	Dec.				
09	Shots counter (Position of 10000)	Dec.				
0A	Error code	Hex.				
0B	Status information (Inferior-order byte)	Hex.				
0C	Status information (Superior-order byte)	Hex.				
0D	CPU version	Hex.				
11	Shutter Dial A/D display	Hex.	Item change by DRIVE, ISO		Ignored	Result display (continuous)
12	Compensation Dial A/D display	Hex.				
13	Focus Dial A/D display	Hex.				
14	Battery Check A/D display	Hex.			← Display in order of "with load" and "without load"	
15	Light metering value display (LVX)	Hex.			← Display in order of "TTL" and "external"	
16	Light metering value code (bv)	Hex.			← Display in order of "TTL" and "external"	
17	Display of AF phase difference data	Hex.				
18	Display of lens model A/D, No.	Hex.			← Display in order of "A/D value" and "No."	

① Storage (writing) in EEPROM is performed when the Shutter Release Switch is turned ON at item No. 00. (Irrespective of the Main Switch position)
② Data change performed with the Main Switch in the "AEL" position for each item is only effective in change of data on CPU memory (RAM). (Therefore, changed data is not stored in memory unless the operation of ① above is performed.
③ The item No. changes in the order listed above.
④ At item NO. 06 or 07, the camera performs external light metering, irrespective of the mounted lens model. (TTL light metering at any other item No.)
⑤ At EEPROM All Clear of item No. 6F, data are not cleared until the Shutter Release Switch is turned ON for more than 2 seconds. (To prevent clear caused by mistake)

[Table of Mode II Items (Main Items)] Note : Do not change data.

Main Item No.	Name	EEPROM Address (Hex.)	Remark
01	Bank 1	00～18	Not used
02	Bank 2	19～31	Hologon (16 mm, F 8.0)
03	Bank 3	32～4A	Not used
04	Bank 4	4B～63	Not used
05	Bank 5	64～7C	Biogon (28 mm, F 2.8)
06	Bank 6	7D～95	Not used
07	Bank 7	96～AE	Planar (45 mm, F 2.0)
08	Bank 8	AF～C7	Not used
09	Bank 9	C8～E0	Sonnar (90 mm, F 2.8)
10	Bank 10	E1～F9	C/Y Adapter
11	Bank 11	FA～FF	History

[Table of Sub Items of Main Item Nos. 01 to 10] Note : Do not change data.

Sub Item No.	Name	Symbol
00	Writing	
01	Information on light metering, auto focusing and AF drive	AES,TLA,AF,LM
02	Light metering exposure compensation	AEj
03	Focal length of lens (inferior-order 8/10 bits)	Lf_L
04	Focal length of lens (superior-order 2/10 bits)	Lf_H
05	GI value (1)	GI1_L
06		GI1_H
07	GI value (2)	GI2_L
08		GI2_H
09	GI value (3)	GI3_L
10		GI3_H
11	GI value (4)	GI4_L
12		GI4_H
13	Temperature compensation coefficient for GI value	GIt
14	Focus limit	LMT
15	Backlash compensation (forward run side)	LB1
16	Backlash compensation (reverse run side)	LB2
17	Backlash compensation (forward forward)	LB3
18	Backlash compensation (reverse reverse)	LB4
19	Infinity adjustment resolution	IFr
20	Infinity position compensation	IFo
21	Nearest distance data	NL
22	Load coefficient	GD
23	Maximum number of stop-down steps	FRG
24	Open F value	FNO
25	Compensation value for lens TTL Flash Auto	STB
26	Value for return to initial position	PIP
27	Focus display resolution	FD
28	In-focus width	JFW
29	Adjusted value for spot light metering	AEsj
30	Braking timing	
31	Not used (Spare)	
↓	↓	
48	Not used (Spare)	
49	00 (Confirmation code)	
50	01 (Confirmation code)	

[Table of Mode Ⅲ Items]

Item No.	Data Stored in EEPROM	Remark
00	Writing of adjusted value	
01	Shutter time adjustment	
02	TTL Flash Auto adjustment	Adjustment of TTL Flash Auto control time
03	TTL light exposure adjustment 1	Lv15
04	TTL light exposure adjustment 2	Lv 8
05	External light exposure adjustment 1	Lv15
06	External light exposure adjustment 2	Lv 8
07	Temperature adjustment 1	Temp. at adjust.: Output difference from standard IC
08	Temperature adjustment 2	Temperature output value at adjustment
09	AF adjustment 1	0.5 m
10	AF adjustment 2	1.0 m
11	AF adjustment 3	2.95 m
12	Auto focusing parallax adjustment	Lateral shift of standard area (simultaneous shift of ref. area))
13	Battery adjustment 1	Adjusted value of B2 level at open voltage check
14	Battery adjustment 2	Adjusted value of B2 level at loaded voltage check
15	Battery adjustment 3	DB adjusted value of open voltage (fixed value)
16	Battery adjustment 4	DB adjusted value of loaded voltage (fixed value)
17	Shutter Dial adjustment 1	1/2000 position
18	Shutter Dial adjustment 2	X position
19	Compensation Dial adjustment 1	+2 position
20	Compensation Dial adjustment 2	−2 position
21	Focus Dial adjustment 1	AF position
22	Focus Dial adjustment 2	∞ position
23	Focus Dial adjustment 3	NEAR position
24	Shutter delay adjusted value	Adjusted value of time "charge release complete→1st curt. Mg OFF"
25	Lens drive adjustment 1	Backlash value (forward run → reverse run)
26	Lens drive adjustment 2	Backlash value (reverse run → forward run)
27	Max. adjusted value for AF inclination	Adjustment of judge value of auto focusing contrast
28	Adjustment of AF F CONT value	Adjustment of judge value of auto focusing contrast
29	Charge adjustment 1	Braking delay time
30	Charge adjustment 2	Braking adjustment
31	Parallax adjustment	Number of pulses
32	Adjustment of flange back	
33	Winding adjustment	Time of braking by reverse run
34	AF temperature compensation coefficient	Temperature characteristic coefficient of AF module
35	F CONT difference	Contrast difference of far distance priority motion
36	Adjustment of AF minimum value	Adjustment of judge value of auto focusing contrast
37	Auto adjustment internal data 1	Data controlled by auto adjuster
38	Auto adjustment internal data 2	Data controlled by auto adjuster
39	Auto adjustment internal data 3	Data controlled by auto adjuster
40	Auto adjustment internal data 4	Data controlled by auto adjuster
41	Auto adjustment internal data 5	Data controlled by auto adjuster
42	Auto adjustment internal data 6	Data controlled by auto adjuster
43	Auto adjustment internal data 7	Data controlled by auto adjuster
44	Auto adjustment internal data 8	Data controlled by auto adjuster
45	Auto adjustment internal data 9	Data controlled by auto adjuster
46	Auto adjustment internal data 10	Data controlled by auto adjuster
47	Exposure counter	
48	Light metering data	At AE Lock
49	ISO setting	
50	Drive mode	
51	Error code	
52	A.B.C. counter	Storage of error data at detection of error (overwrite)
53	Film threshold level L	SH L of winding pulse detected at blank shots advance
54	Film threshold level H	SH H of winding pulse detected at blank shots advance
55	Shots counter L	Cumulative counter
56	Shots counter M	Cumulative counter
57	Shots counter H	Cumulative counter
58	Option setting content L	
59	Option setting content H	
60	Status information L	
61	Status information H	

C-5-2. Dial A/D Adjustment

* There are two dials, namely, the Shutter Speed/Exposure Compensation Dial (SH Dial) and the Focus Dial (FD Dial). When a dial is set to the index, the indication of the dial may be different from the display on the camera side (viewfinder display for SH or display on the Mode LCD for FD). In such a case, the dial A/D adjustment is required.
* At dial A/D adjustment, the adjusted value (data) displayed on the Mode LCD and the adjustment item No. displayed on the Exposure Counter LCD are expressed in hexadecimal. To obtain an adjusted value, convert the hexadecimal number to a decimal number using the Conversion Table for Decimal Numbers & Hexadecimal Numbers (+) (page C-31). After obtaining an adjusted value in decimal, convert the decimal number to an hexadecimal number using the Conversion Table for Decimal Numbers & Hexadecimal Numbers (+/−) (page C-32). Then write the hexadecimal value at the adjustment item. In the text below, each hexadecimal number is followed by (H) or (Hex) while each decimal number is followed by (D) or (Dec).

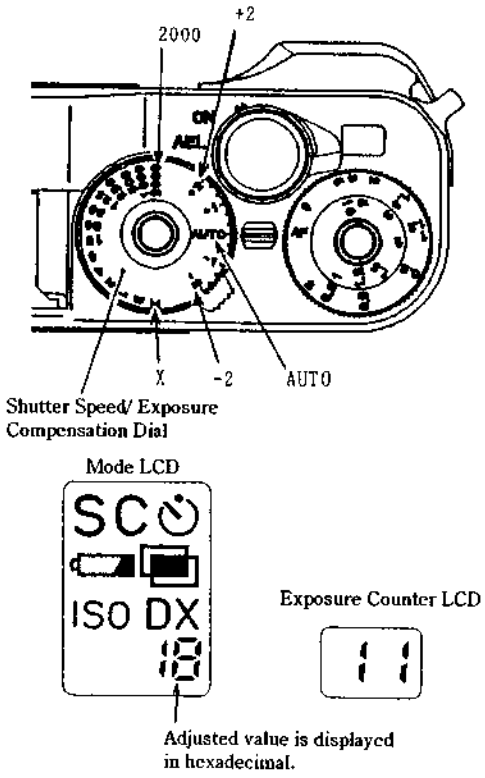
1. Shutter Speed/Exposure Compensation Dial (SH Dial)

[1] A/D Adjustments for Shutter Speed Setting Side

* The indications of the Shutter Speed Dial are "2000, 1000, ----, B, X". Among them, make adjustments for the indications on both ends, that is, "2000" and "X". Make the adjustments as follows:

1) Turn ON the Main Switch of the camera and open the Back Cover.
2) Press the Manual Rewind Button and press the Shutter Release Button while keeping the Manual Rewind Button pressed to set manual adjusting mode.
3) Set the A.B.C. Lever to "OFF" (Mode Ⅰ).
4) Set item No. 11 (Shutter Dial A/D display) by pressing the Drive Button.
5) Turn the dial and set it to "2000". At this point, the Mode LCD will display the current A/D value (hexadecimal) for "2000". Then note down the A/D value.
6) Turn the dial and set it to "X". At this point, the Mode LCD will display the current A/D value (hexadecimal) for "X". Then note down the A/D value.

   The adjusted value is obtained by subtracting each A/D value from the designed value.



Adjusted value for "2000" position = Designed value (18 (H)) − A/D value for "2000" position
Adjusted value for "X" position = Designed value (E8 (H)) − A/D value for "X" position

Dial Position	Designed Value	Item No. for Writing
2000	18	Mode Ⅲ No. 17
X	E8	Mode Ⅲ No. 18

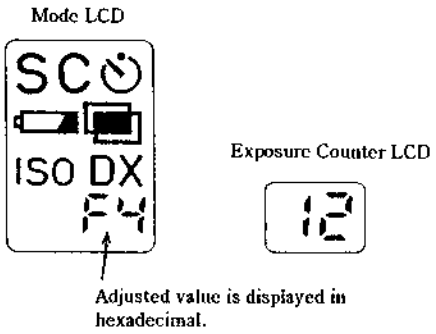
7) Change the setting position of the A.B.C. Lever to "± 1.0" (Mode Ⅲ).
8) Set item No. 17 (Shutter Dial adjustment 1) by pressing the Drive Button.
9) Change the setting position of the Main Switch to "AE Lock".
10) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value for "2000" position obtained at 6).

11) Change the setting position of the Main Switch to "ON".
12) Set item No. 18 (Shutter Dial adjustment 2) by pressing the Drive Button.
13) Change the setting position of the Main Switch to "AE Lock".
14) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value for "X" position obtained at 6).
15) Change the setting position of the Main Switch to "ON".
16) Set item No. 00 (Writing of adjusted values) by pressing the ISO Button.
17) Write the adjusted values in EEPROM by pressing the Shutter Release Button.

[2] A/D Adjustments for Exposure Compensation Side

* The indications of the Exposure Compensation Dial are "+ 2, ----, AUTO, ----, − 2". Among them, make adjustments for the indications on both ends, that is, "+ 2" and "− 2". Make the adjustments as follows :

1) Set the A.B.C. Lever to "OFF" (Mode Ⅰ).
2) Set item No. 12 (Exposure Compensation Dial A/D display) by pressing the Drive Button.
3) Turn the dial and set it to "+ 2". At this point, the Mode LCD will display the current A/D value (hexadecimal) for "+ 2". Then note down the A/D value.
4) Turn the dial and set it to "AUTO". At this point, the Mode LCD will display the current A/D value (hexadecimal) for "AUTO". Then note down the A/D value.
5) Turn the dial and set it to "− 2". At this point, the Mode LCD will display the current A/D value (hexadecimal) for "− 2". Then note down the A/D value.
6) To take into consideration the linearity of the resistor, calculate one half (HAV) of the difference in the A/D value between at the "AUTO" point (theoretical point: HAC) calculated from the A/D values for "+ 2" and "− 2" and at the actual "AUTO" position.



Let HP2 be the A/D value reading for "+ 2", HM2 be the A/D value reading for "− 2" and HOA be the A/D value reading for "AUTO".

Calculate the theoretical point of "AUTO".
HAC = (HM2 − HP2) ÷ 2
Calculate one half of the difference in A/D value for "AUTO".
HAV = (HOA − HAC) ÷ 2

7) Calculate the adjusted value for the "+ 2" side.
Adjusted value for exposure compensation 1 (+2 side) = Designed value (28(H)) − (HP2+HAV)

8) Calculate the adjusted value for the "− 2" side.
Adjusted value for exposure compensation 2 (−2 side) = Designed value (E8(H)) − (HM2+HAV)

Dial Position	Designed Value (H)	Item No. for Writing
+ 2	28	Mode Ⅲ No. 19
− 2	E8	Mode Ⅲ No. 20

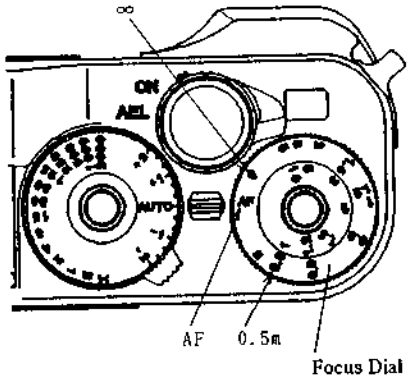
9) Change the setting position of the A.B.C. Lever to "± 1.0" (Mode III).
10) Set item No. 19 (Compensation Dial adjustment 1) by pressing the Drive Button.
11) Change the setting position of the Main Switch to "AE Lock".
12) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value for "+ 2" position obtained at 7).
13) Change the setting position of the Main Switch to "ON".
14) Set item No. 20 (Compensation Dial adjustment 2) by pressing the Drive Button.
15) Change the setting position of the Main Switch to "AE Lock".
16) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value for "− 2" position obtained at 8).
17) Change the setting position of the Main Switch to "ON".
18) Set item No. 00 (Writing of adjusted values) by pressing the ISO Button.
19) Write the adjusted values in EEPROM by pressing the Shutter Release Button.

2. Focus Dial (FD Dial)

* The indications of the Focus Dial are "AF, ∞, 5, 3, 2, 1.5, ---, 0.5"(external indications, however). Among them, make adjustments for three positions "AF", "∞" and "0.5 m". Make the adjustments as follows :

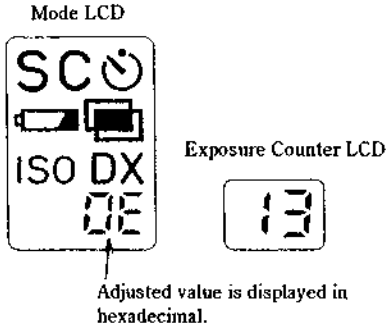
[1] A/D Adjustments for "AF" and "0.5 m" Positions

1) Set the A.B.C. Lever to "OFF" (Mode Ⅰ).
2) Set item No. 13 (Focus Dial A/D display) by pressing the Drive Button.
3) Turn the dial and set it to "AF". At this point, the Mode LCD will display the current A/D value (hexadecimal) for "AF". Then note down the A/D value.
4) Turn the dial and set it to "0.5 m". At this point, the Mode LCD will display the current A/D value (hexadecimal) for "0.5 m". Then note down the A/D value.
5) The adjusted value is obtained by subtracting the designed value from each A/D value.



Adjusted value for "AF" position = A/D value for "AF" position − Designed value (OF(H))
Adjusted value for "0.5 m" position = A/D value for "0.5 m" position − Designed value (F1(H))

Dial Position	Designed Value (H)	Item No. for Writing
AF	0F	Mode III No. 21
0.5	F1	Mode III No. 23



6) Change the setting position of the A.B.C. Lever to "± 1.0" (Mode III).
7) Set item No. 21 (Focus Dial adjustment 1) by pressing the Drive Button.
8) Change the setting position of the Main Switch to "AE Lock".
9) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value for "AF" position obtained at 5).
10) Change the setting position of the Main Switch to "ON".
11) Set item No. 23 (Focus Dial adjustment 3) by pressing the Drive Button.
12) Change the setting position of the Main Switch to "AE Lock".
13) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value for "0.5 m" position obtained at 5).
14) Change the setting position of the Main Switch to "ON".
15) Set item No. 00 (Writing of adjusted values) by pressing the ISO Button.
16) Write the adjusted values in EEPROM by pressing the Shutter Release Button.

[2] A/D Adjustments for "∞" Position

1) Set the A.B.C. Lever to "OFF" (Mode Ⅰ).
2) Set item No. 13 (Focus Dial A/D display) by pressing the Drive Button.
3) Turn the dial and set it to "∞". At this point, the Mode LCD will display the current A/D value (hexadecimal) for "∞". Then note down the A/D value.
4) Calculate the adjusted value for "θ2" position from the A/D value for "0.5 m" position and the A/D value for "1.5 m" position.

Note: As the A/D value for "0.5 m" position, use the A/D value for "0.5 m" which is read and written down at [1] 4).

Calculate the inclination "θ2" of the straight line through the "0.5 m" point and "1.5 m" point:

$$\theta 2 = \frac{\text{A/D value for "0.5 m" position} - \text{A/D value for "1.5 m" position}}{85(\text{H})}$$

5) Calculate the point (X ∞) corresponding to the "∞" on the extension of the straight line through the "0.5 m" point and "1.5 m" point:

X ∞ = A/D value for "0.5 m" − (θ2 ×200 (D))

6) Calculate the adjusted value for "∞" position by subtracting the designed value from the "X ∞ " obtained at 5):

Adjusted value for "∞" position = X ∞ − Designed value (29 (H))

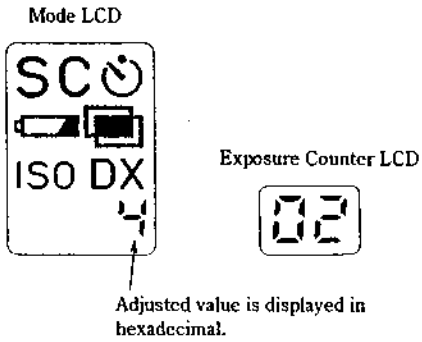
7) Change the setting position of the A.B.C. Lever to "± 1.0" (Mode Ⅲ).
8) Set item No. 22 (Compensation Dial adjustment 2) by pressing the Drive Button.
9) Change the setting position of the Main Switch to "AE Lock".
10) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value for "∞" position obtained at 6).
11) Change the setting position of the Main Switch to "ON".
12) Set item No. 00 (Writing of adjusted values) by pressing the ISO Button.
13) Write the adjusted value in EEPROM by pressing the Shutter Release Button.
14) Complete manual adjusting mode by turning OFF the Main Switch or closing the Back Cover.

C-5-3. Shutter Time Adjustment

* Adjust the shutter time on the high speed (1/2000) side.
* Make this adjustment before the light exposure (light metering) adjustment.
* Measure the shutter time using the shutter tester. Then determine the adjusted value from the previously set adjusted value and the difference calculated from the measured value. Since adjusted values are displayed in decimal, use decimal numbers in calculation. Write the new adjusted value of a decimal number in EEPROM.
* Even without quitting item No. 02 in Manual Adjustment Mode I the camera operates normally (at the set shutter time) if the shutter is released.

<Adjusting Tool>
• Shutter tester

1) Set the Shutter Speed Dial of the camera to "1/2000".
2) Set the Focus Dial to the infinity position "∞".
3) Turn ON the Main Switch of the camera and open the Back Cover.
4) Press the Manual Rewind Button and press the Shutter Release Button while keeping the Manual Rewind Button pressed to set manual adjusting mode.
5) Set the A.B.C. Lever to "OFF".
6) Set item No. 02 (Shutter time adjustment) by pressing the Drive Button. At this point, the Mode LCD will display the current adjusted value for shutter time of 1/2000 in decimal. Then note down the adjusted value.



7) Set the camera on the shutter tester.
8) Release the shutter about ten times, measaure the shutter time and calculate the average.
9) Let SPx (μsec) be the average of the shutter time and calculate the adjusted value for the shutter time using the following formula :

TDX = (488 (μsec) − SPx) ÷ 20

(Round off to decimals.)

Let TAJ' be the previously input adjusted value for the shutter time.

Adjusted value for shutter time = TAJ' + TDX

[Example]
If the average of shutter time measured with the shutter tester SPx = 530 μsec and the previously input adjusted value for shutter time is − 1:

TDX = (488 − 530) ÷ 20
= − 2.1
≒ − 2
Adjusted value for shutter time = − 1 + (− 2)
= − 3

10) Change the setting position of the Main Switch to "AE Lock".
11) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value for shutter time obtained at 9).
12) Change the setting position of the Main Switch to "ON".
13) Set item No. 00 (Writing of adjusted values) by pressing the ISO Button.
14) Write the adjusted value in EEPROM by pressing the Shutter Release Button.
15) Complete manual adjusting mode by turning OFF the Main Switch or closing the Back Cover.

* Even without quitting item No. 2 in Manual Adjustment Mode I ,it is possible to check the shutter time by pressing the Shutter Release Button. After inputting the adjusted value, therefore, operate the shutter and make certain that the shutter time is close to 488 μsec.

* By this check, if the average of shutter time is found out of the range of 488 ± 100 μsec, change the previously input adjusted value and operate the shutter for fine adjustment.

(Allowable Range of Manual Shutter Speed)

Shutter Speed	Upper Limit ms	Reference Center Value ms	Lower Limit ms	Tolerance
1	1231.00	1000.00	812.00	±0.3EV
1/2	615.00	500.00	406.00	±0.3EV
1/4	307.00	250.00	203.00	±0.3EV
1/8	153.00	125.00	101.00	±0.3EV
1/15	76.50	62.50	50.70	±0.3EV
1/30	38.47	31.25	25.38	±0.3EV
1/60	19.23	15.63	12.69	±0.3EV
1/125	9.61	7.81	6.34	±0.3EV
1/250	4.80	3.91	3.17	±0.3EV
1/500	2.40	1.95	1.58	±0.3EV
1/1000	1.28	0.98	0.74	±0.4EV
1/2000	0.74	0.49	0.32	±0.4EV
X 1/100	12.01	9.76	7.92	±0.3EV

C-5-4. TTL Flash Auto Adjustment

* Adjust the TTL Flash Auto control value for use with the TLA Flash Unit.
* Mount the specified lens and flash unit on the camera to be adjusted, measure ΔEV with a flash meter and calculate the adjusted value for TTL Flash Auto control. Since adjusted values are displayed in decimal, use decimal numbers in calculation. Write the new adjusted value of a decimal number in EEPROM.
* When measuring the TTL Flash Auto control value, use a standard reflector paper (gray chart with a reflectivity of 18 %) and prevent the entrance of external light.

<Adjusting Tools>

- Lens : 45 mm, F 2.0 (Planar).
- Flash unit : Flash unit of TLA system (TLA140)
- Flash meter
- Tripod

1) Load the Ektachrome 64 film in the camera.
2) Mount the lens and the flash unit on the camera.
3) Mount the camera on the tripod.
4) Set the flash meter and place the tripod at 2 m from the flash meter.
5) Set the aperture for the lens to F 4.0.
6) Set the Shutter Speed Dial of the camera to "AUTO", the Focus Dial to "2 m" and the ISO to "100" (ISO DX 100 is allowed).
7) Fire the flash several times by operating the shutter and calculate the average of ΔEV.

Let FDX be the average of ΔEV of the flash meter and calculate the adjusted value for TTL Flash Auto control from the following formula :

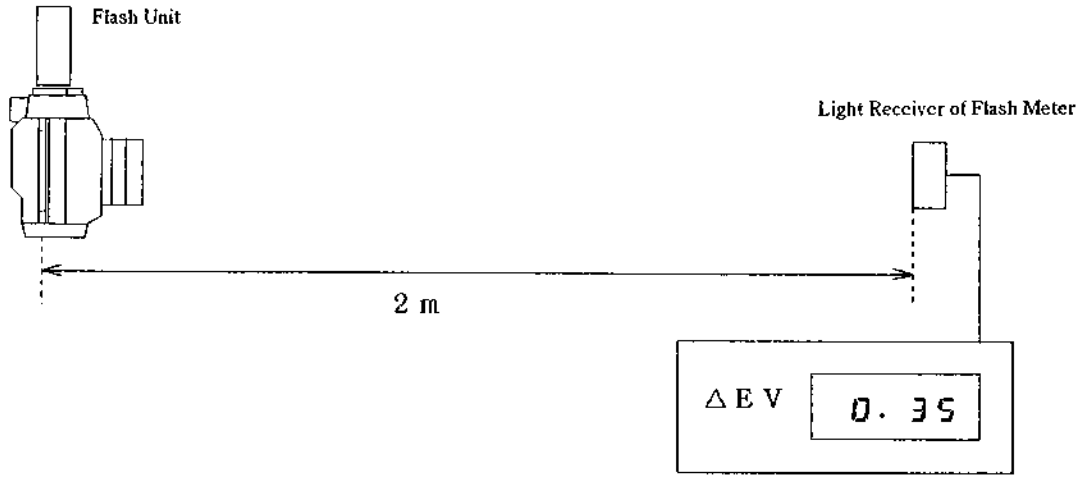
Adjusted value for TTL Flash Auto control = FDX ÷ (−0.33) (EV)

(Round off to decimals.)

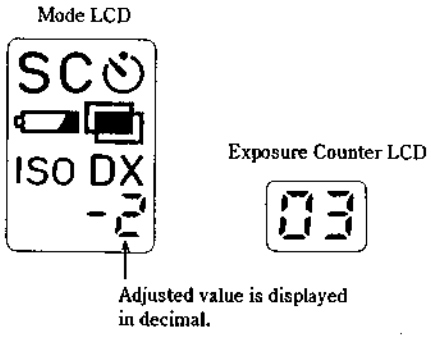
* Add the previously input adjusted value for TTL Flash Auto control to the value obtained from the formula above. The resultant adjusted value for TTL Flash Auto control must be within the following range :

$-5 \leqq$ Adjusted value for TTL Flash Auto control $\leqq +4$

If the adjusted value is not within this range, there may be some trouble elsewhere.



8) Turn ON the Main Switch of the camera and open the Back Cover.
9) Press the Manual Rewind Button and press the Shutter Release Button while keeping the Manual Rewind Button pressed to set manual adjusting mode.
10) Keep the A.B.C. Lever in the "OFF" position (Mode I).
11) Set item No. 03 (TTL Flash Auto adjustment) by pressing the Drive Button.
12) Change the setting position of the Main Switch to "AE Lock".
13) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value for TTL Flash Auto control obtained at 7).
14) Change the setting position of the Main Switch to "ON".
15) Set item No. 00 (Writing of adjusted values) by pressing the ISO Button.
16) Write the adjusted value in EEPROM by pressing the Shutter Release Button.
17) Repeat steps 1) to 16) until ΔEV becomes within the range of ± 0.5 EV.
18) Complete manual adjusting mode by turning OFF the Main Switch or closing the Back Cover.



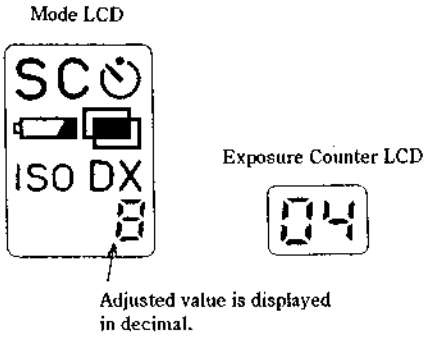
C-5-5. Light Exposure Adjustments

* Before making the light exposure adjustments, be sure to make the shutter time adjustment.
* As a rule, make the reference adjustment at LV 15 and the inclination adjustment at LV8.
* Measure the light exposure using the AE tester, and determine the adjusted value from the previously set adjusted value and the difference calculated from the measured value. Since adjusted values are displayed in decimal, use decimal numbers in calculation. Write the new adjusted value of a decimal number in EEPROM.
* Set item No. 04 or 05 in Manual Adjustment Mode Ⅰ. In this state, release the shutter, and the camera will operate normally (perform auto exposure control).

<Adjusting Tools>
- Lens: 45 mm, F 2.0 (Planar).
- AE tester

1. TTL Light Exposure Adjustment 1

1) Mount the lens 45 mm, F 2.0 (Planar) on the camera. Set the aperture for the lens to F 5.6.
2) Set the Shutter Speed Dial of the camera to "AUTO", the Focus Dial to the infinity position "∞" and the ISO to "100" (ISO DX 100 is allowed).
3) Set the AE tester to "LV 15" (K value : 1.3).
4) Turn ON the Main Switch of the camera and open the Back Cover.
5) Press the Manual Rewind Button and press the Shutter Release Button while keeping the Manual Rewind Button pressed to set manual adjusting mode.



6) Set the A.B.C. Lever to "OFF" (Mode Ⅰ).
7) Set item No. 04 (TTL light exposure adjustment 1) by pressing the Drive Button. At this point, the Mode LCD will display the current adjusted value (LVTDH') for TTL light exposure adjustment 1 in decimal. Then note down the adjusted value.
8) Set the camera on the AE tester.
9) Operate the shutter several times, calculate the average (XHEV) of ΔEV of the AE tester and obtain the value (LVTDH) for TTL light exposure adjustment 1 from the following formula:

LVXH = XHEV ÷ (−0.125) (EV)

(Round off to decimals.)

Let LVTDH' be the previously input value for TTL light exposure adjustment 1.

LVTDH = LVTDH' + LVXH

[Example]
Average of ΔEV of AE tester with shutter operated (XHEV) : + 0.53 EV
Previously input value for TTL light exposure adjustment 1 (LVTDH') : − 1

LVXH = 0.53 ÷ (− 0.125)
= − 4.24
≒ − 4

LVTDH = − 1 + (− 4)
= − 5

10) Change the setting position of the Main Switch to "AE Lock".
11) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value (LVTDH) for TTL light exposure adjustment 1 obtained at 9).
    * In changing the adjusted value, keep the A.B.C. Lever in the "OFF" position (Mode I).
12) Turn ON the Main Switch.
13) Set item No. 00 (Writing of adjusted values) by pressing the ISO Button.
14) Write the adjusted value in EEPROM by pressing the Shutter Release Button.

2. TTL Light Exposure Adjustment 2

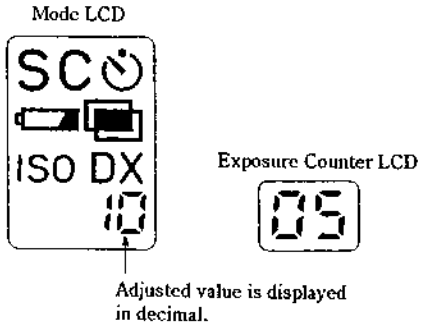
15) Set the AE tester to "LV 8" (K value : 1.3).
16) Set item No. 05 (TTL light exposure adjustment 2) by pressing the Drive Button.
17) Operate the shutter several times, calculate the average (XLEV) of ΔEV of the AE tester and obtain the value for TTL light exposure adjustment 2 from the following formula :

    LVXL = XLEV ÷ (−0.125) (EV)

    (Round off to decimals.)

    Let LVTDL' be the previously input value for TTL light exposure adjustment 2.

    LVTDL = LVTDL' + LVXL



[Example]

Average of ΔEV of AE tester with shutter operated (XLEV) : − 0.47 EV
Previously input value for TTL light exposure adjustment 2 (LVTDL') : + 1

LVXL = − 0.47 ÷ (− 0.125) (EV)
= 3.76
≒ 4

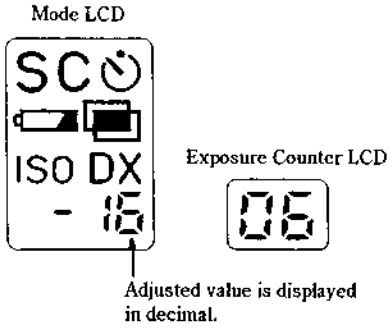
LVTDL = 1 + 4
= 5

18) Change the setting position of the Main Switch to "AE Lock".
19) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value (LVTDL) for TTL light exposure adjustment 2 obtained at 17).
20) Change the setting position of the Main Switch to "ON".
21) Set item No. 00 (Writing of adjusted values) by pressing the ISO Button.
22) Write the adjusted value in EEPROM by pressing the Shutter Release Button.
23) Repeat steps 1) to 22) until ΔEV (LVHEV, LVLEV) becomes within the range of ± 0.5 EV. (Adjust until it becomes close to zero.)

3. External Light Metering Adjustment 1

* Set item No. 06 or 07 in Manual Adjustment Mode Ⅰ. In tis state, release the shutter, and the camera will operate normally (perform auto exposure control).

<Adjusting Tools>
- Lens : 16 mm, F 8.0 (Hologon).
- AE tester



1) Mount the Hologon lens on the camera
2) Set the Shutter Speed Dial of the camera to "AUTO", the Focus Dial to the infinity position "∞" and the ISO to "100" (ISO DX 100 is allowed).
3) Set the AE tester to "LV 15" (K value : 1.3).
4) Turn ON the Main Switch of the camera and open the Back Cover.
5) Press the Manual Rewind Button and press the Shutter Release Button while keeping the Manual Rewind Button pressed to set manual adjusting mode.
6) Set the A.B.C. Lever to "OFF".
7) Set item No. 06 (External light exposure adjustment 1) by pressing the Drive Button. At this point, the Mode LCD will display the current adjusted value (LVGDH') for external light exposure adjustment 1 in decimal. Then note down the adjusted value.
8) Set the camera on the AE tester.
9) Operate the shutter several times, calculate the average (XHEV) of ΔEV of the AE tester and obtain the value (LVGDH) for external light exposure adjustment 1 from the following formula:

   LVXH = XHEV ÷ (−0.125) (EV)

   (Round off to decimals.)

   Let LVGDH' be the previously input value for external light exposure adjustment 1.

   LVGDH = LVGDH' + LVXH

[Example]

Average of ΔEV of AE tester with shutter operated (XHEV) : + 0.53 EV
Previously input value for external light exposure adjustment 1 (LVGDH') : − 1

LVXH = 0.53 ÷ (− 0.125) (EV)
= − 4.24
≒ −4

LVGDH = − 1 + (−4)
= − 5

10) Change the setting position of the Main Switch to "AE Lock".
11) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value (LVGDH) for external light exposure adjustment 1 obtained at 9).

* In changing the adjusted value, keep the A.B.C. Lever in the "OFF" position (Mode Ⅰ).

12) Turn ON the Main Switch.
13) Set item No. 00 (Writing of adjusted values) by pressing the ISO Button.
14) Write the adjusted value in EEPROM by pressing the Shutter Release Button.

4. External Light Exposure Adjustment 2

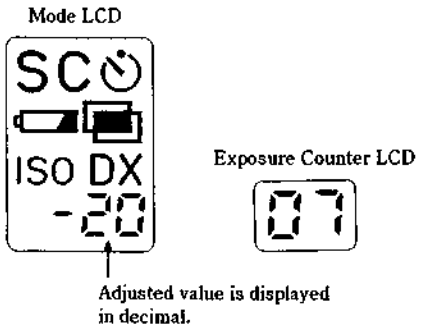
15) Set the AE tester to "LV 8" (K value : 1.3).
16) Set item No. 07 (External light exposure adjustment 2) by pressing the Drive Button.
17) Operate the shutter several times, calculate the average (XLEV) of ΔEV of the AE tester and obtain the value for external light exposure adjustment 2 from the following formula :

LVXL = XLEV ÷ (−0.125) (EV)

(Round off to decimals.)

Let LVGDL' be the previously input value for external light exposure adjustment 2.

LVGDL = LVGDL' + LVXL



[Example]
Average of ΔEV of AE tester with shutter operated (XLEV) : − 0.47 EV
Previously input value for external light exposure adjustment 2 (LVGDL') : + 1

LVXL = − 0.47 ÷ (− 0.125) (EV)
= 3.76
≒ 4

LVGDL = 1 + 4
= 5

18) Change the setting position of the Main Switch to "AE Lock".
19) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value (LVGDL) for external light exposure adjustment 2 obtained at 17).
20) Change the setting position of the Main Switch to "ON".
21) Set item No. 00 (Writing of adjusted values) by pressing the ISO Button.
22) Write the adjusted value in EEPROM by pressing the Shutter Release Button.
23) Repeat steps 1) to 22) until ΔEV (LVHEV, LVLEV) becomes within the range of ± 0.5 EV. (Adjust until it becomes close to zero.)
24) Complete manual adjusting mode by turning OFF the Main Switch or closing the Back Cover.

Allowable Range of Light Exposure

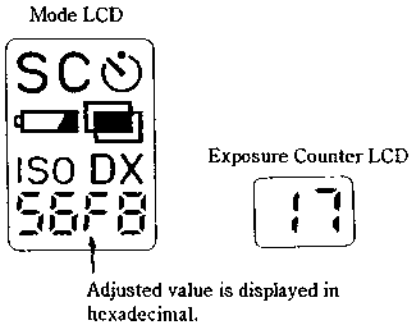
Brightness (LV)	Allowable Range
9 (8)	-0.5 ~ +0.5 EV
12	-0.5 ~ +0.5 EV
15	-0.5 ~ +0.5 EV

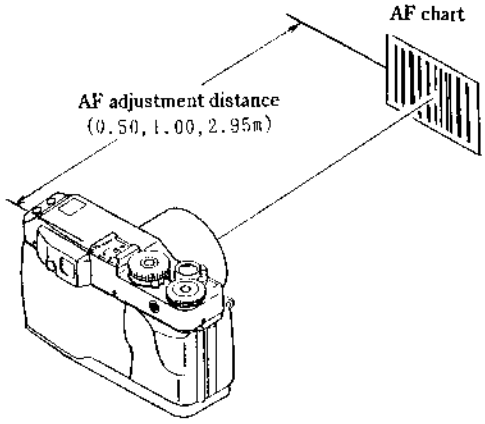
C-5-6. AF Adjustment

* In the stage where the camera has not been adjusted, there is a difference between the distance metering result of the camera and the actual distance. Therefore, make the AF adjustment in order that the distance metering result becomes equal to the actual distance. For this adjustment, there are three adjusted values for the distances 0.50 m, 1.00 m and 2.95m. Make the adjustment by the procedure described below.
* The data read by the procedure below are expressed in hexadecimal. To obtaine an adjusted value, convert the hexadecimal number to a decimal number. After obtaining an adjusted value in decimal, convert it to a hexadecimal number. Then write the hexadecimal value at the adjustment item. In the text below, each hexadecimal number is followed by (H) while each decimal number is followed by (D).

<Adjusting Tools>
- AF chart
- Tripod

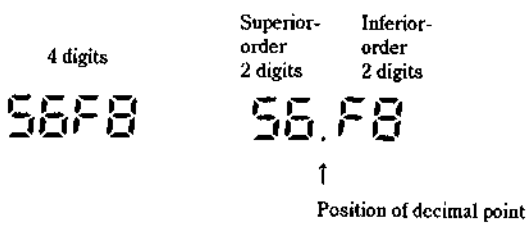
1) Fix the AF chart on the wall.
2) Turn ON the Main Switch of the camera and open the Back Cover.
3) Press the Manual Rewind Button and press the Shutter Release Button while keeping the Manual Rewind Button pressed to set manual adjusting mode.
4) Mount the camera on the tripod.
5) Set the tripod so that the optical axis of the camera is perpendicular to the AF Chart and the distance from the AF Chart to the Distance Reference Index of the camera is 0.50 m.
6) Set the A.B.C. Lever to "OFF" (Mode Ⅰ).
7) Set item No. 17 (Display of AF phase difference data) by pressing the Drive Button. At this point, the 4-digit data (hexadecimal number) displayed on the Mode LCD will represent the current distance metering data for "0.50 m". Note down the displayed data more than 15 seconds after the setting.
   *The Focus Dial may be in any position.
8) Set the camera mounted on the tripod at 1.00 m from the AF chart.
   The 4-digit data (hexadecimal number) displayed on the Mode LCD will represent the current distance metering data for "1.00 m". Note down the displayed data more than 15 seconds after the setting at 1.00 m position.
9) Set the camera mounted on the tripod at 2.95 m from the AF chart.
   The 4-digit data (hexadecimal number) displayed on the Mode LCD will represent the current distance metering data for "2.95 m". Note down the displayed data more than 15 seconds after the setting at 2.95 m position.





10) The adjusted value (data) displayed on the Mode LCD is expressed in hexadecimal. To obtain an adjusted value, convert the hexadecimal number to a decimal number using the Conversion Table for Decimal Numbers & Hexadecimal Numbers (+) (page C-31). After obtaining an adjusted value in decimal, convert the decimal number to an hexadecimal number using the Conversion Table for Decimal Numbers & Hexadecimal Numbers (+/−) (page C-32). Then write the hexadecimal value at the adjustment item.

(1) Separate the 4-digit data into the superior-order 2-digit part and the inferior-order 2-digit part.
(The superior-order 2 digits represent the integral part and the inferior-order 2 digits the decimal part.)



[Example]
If the data for "0.50 m" is 56F8(H) :

56F8(H) → 56.F8

(2) Convert the superior-order 2 digits to a decimal number using the Conversion Table (+). (See Page C-31)
This number represents the value of the integral part. — 56(H) → 86(D)

(3) Convert the inferior-order 2 digits to a decimal number using the Conversion Table (+). (See Page C-31) — F8(H) → 248(D)

(4) Divide the decimal number obtained at (3) by 256.
The resultant value represents the decimal part. — 248 ÷256 = 0.96875(D)

(5) Combine the integral part and the decimal part.
The resultant value represents the data expressed in decimal number. — 86.96875(D)

11) Calculate the adjusted values.

Based on the obtained data, calculate the adjusted values from the following formulas:

Adjusted value for "0.50 m" = (Measured value for "0.50 m") − 84.671875(D)
Adjusted value for "1.00 m" = (Measured value for "1.00 m") − 115.109375(D)
Adjusted value for "2.95 m" = (Measured value for "2.95 m") − 134.328125(D)

If the absolute value of any result value exceeds 7.9375(D), which is the adjustable limit, the adjustment is impossible. That is, the adjustment is possible when the result values are within the following range :

− 7.9375 < Result value < 7.9375

The result values are the adjusted values (decimal numbers). — 86.96875 − 84.671875 = 2.296875(D)

12) Convert the decimal number for each adjusted value to a hexadecimal number.

(1) Multiply each value obtained at 11) by 16. — 2.296875 × 16 =36.75(D)

(2) Round off each resultant value to decimals. — 36.75
The first decimal place : 7 (to round up)
→ 37

(3) Convert these values to hexadecimal numbers using the Conversion Table for Decimal Numbers & Hexadecimal Numbers (+/−).
These hexadecimal numbers are the adjusted values. — 37(D) → 25 (H)

[Example 2]
If the data for "1.00 m" is 7002(H) :
10) (1) 7002(H) → 70.02(D)
(2) 70(H) → 112(D) (Convert hexadecimal number to decimal number)
(3) 02(H) → 2(D) (Convert hexadecimal number to decimal number)
(4) 2 ÷ 256 = 0.0078125(D)
(5) 112.0078125(D)

11) 112.0078125(D) − 114.90625 = − 2.8984375(D) (Adjustment possible)
12) (1) − 2.8984375 × 16 = − 46.375(D)
(2) The first decimal place : 3 (to round down) → −46(D)
(3) −46(D) → D2(H) (Convert decimal number to hexadecimal number) (Use Conversion Table (+/−)) (See Page C-32)
Therefore, the adjusted value is D2(H).
Write this value.
13) Write the adjusted values obtained for respective distances at the following item Nos.:

AF Adjustment Distance	Item No. for Writing
0.50 m	Mode III No. 9
1.00 m	Mode III No. 10
2.95 m	Mode III No. 11

(1) Change the setting position of the A.B.C. Lever to "± 1.0" (Mode III).
(2) Set item No. 9 (AF adjustment 1) by pressing the Drive Button.
(3) Change the setting position of the Main Switch to "AE Lock".
(4) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value for "0.50 m" obtained at 12).
(5) Change the setting position of the Main Switch to "ON".
(6) Set item No. 10 (AF adjustment 2) by pressing the Drive Button.
(7) Change the setting position of the Main Switch to "AE Lock".
(8) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value for "1.00 m" obtained at 12).
(9) Change the setting position of the Main Switch to "ON".
(10) Set item No. 11 (AF adjustment 3) by pressing the Drive Button.
(11) Change the setting position of the Main Switch to "AE Lock".
(12) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value for "2.95 m" obtained at 12).
(13) Change the setting position of the Main Switch to "ON".
(14) Set item No. 00 (Writing of adjusted values) by pressing the ISO Button.
(15) Write the adjusted values in EEPROM by pressing the Shutter Release Button.

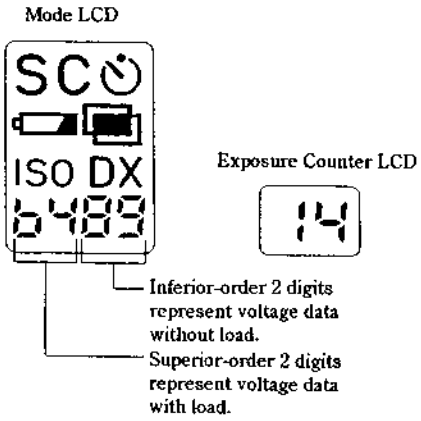
14) Complete manual adjusting mode by turning OFF the Main Switch or closing the Back Cover.

C-5-7. Battery Check Adjustment

* Supply specified voltages from the Regulated DC Power Supply and check the voltage check A/D values in manual adjusting mode. Calculate the adjusted values from these A/D values and store them in memory as the adjusted values for battery check .
* The adjusted values (data) displayed on the Mode LCD are all expressed in hexadecimal. To obtain an adjusted value, convert the hexadecimal number to a decimal number using the Conversion Tables for Decimal Numbers & Hexadecimal Numbers (pages C-31 and C-32). After obtaining an adjusted value in decimal, convert the decimal number to an hexadecimal number. Then write the hexadecimal value at the adjustment item.

<Adjusting Tools>
- **Regulated DC Power Supply**
- **Dummy battery**

1) Set the Regulated DC Power Supply to 6 V.
2) Set the dummy battery in the battery chamber of the camera.
3) Turn ON the Main Switch of the camera and open the Back Cover.
4) Press the Manual Rewind Button and press the Shutter Release Button while keeping the Manual Rewind Button pressed to set manual adjusting mode.
5) Set the A.B.C. Lever to "OFF" (Mode I).
6) Set item No. 14 (Battery adjustment 2) by pressing the Drive Button. At this point, the Mode LCD will display 4-digit data (hexadecimal number).
   The superior-order 2 digits represent the voltage data with load and the inferior-order 2 digits the voltage data without load.
7) Lower the setting voltage of the Regulated DC Power Supply to 4.1 V.
   Convert the superior-order 2 digits of the voltage data to a decimal number using the Conversion Table for Decimal Numbers & Hexadecimal Numbers (+).
8) Calculate the adjusted values.


Mode LCD
ISO DX
Exposure Counter LCD
14
Inferior-order 2 digits represent voltage data without load.
Superior-order 2 digits represent voltage data with load.

Adjusted value for loaded battery check = (Decimal data obtained at 7)) − 115 (D)
Adjusted value for no-load battery check = (Adjusted value for loaded battery check) + 13 (D)
Convert the obtained adjusted values to hexadecimal numbers. (Use Conversion Table (+/−))

9) Return the voltage of the Regulated DC Power Supply to 6 V.
10) Change the setting position of the A.B.C. Lever to "± 1.0" (Mode III).
11) Set item No. 13 (Battery adjustment without load) by pressing the Drive Button.
12) Change the setting position of the Main Switch to "AE Lock".
13) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value for no-load battery check obtained at 8).
14) Change the setting position of the Main Switch to "ON".
15) Set item No. 14 (Battery adjustment with load) by pressing the Drive Button.
16) Change the setting position of the Main Switch to "AE Lock".
17) By pressing the Drive Button or the ISO Button, change the value displayed on the Mode LCD to the adjusted value for loaded battery check obtained at 8).

    Write the adjusted value for no-load battery check at item No. 13 in Mode III .
    Write the adjusted value for loaded battery check at item No. 14 in Mode III .
    FF (Hex) (fixed value) at item No. 15 in Mode III
    FF (Hex) (fixed value) at item No. 16 in Mode III

18) Change the setting position of the Main Switch to "ON".
19) Set item No. 00 (Writing of adjusted values) by pressing the ISO Button.
20) Write the adjusted values in EEPROM by pressing the Shutter Release Button.
21) Complete manual adjusting mode by turning OFF the Main Switch or closing the Back Cover.

C-5-8. Error Code

* At the occurrence of an error in camera operation, the error is coded and stored in EEPROM.
* The error code value is written only at the occurrence of an error and is not overwritten when there is no occurrence of a new error; the previous error code value is kept in memory as long as the camera is operating normally.
  In manual adjusting mode, it is possible to display or rewrite the error code.

Error Code Table

Code	Error	Code	Error
00	(No error)	10	B2 error : power on without load
01	Charge release error	11	B2 error : power on with load
02	Charge error	12	B2 error : release sequence (charge release)
03	Lens drive initial position error ※1	13	B2 error : rewinding
04	Lens drive pulse error ※2	14	B2 error : blank shots advance
05		15	B2 error : Bulb operation
06		16	
07		17	
08		18	
09		19	
0A		1A	
0B		1B	
0C		1C	
0D		1D	
0E		1E	
0F		1F	

[Error Recovery Procedure]

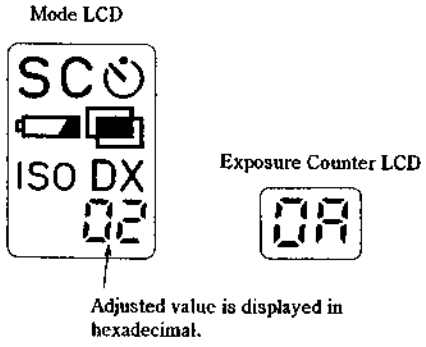
a) Charge release error
   Error code : 01
   Error conditions : Charge completion (Charge Switch 2 : "Hi" → "Low") has not been detected within 150 msec after the start of Charge Motor.
   Recovery procedure : Stop the Charge Motor (DRIV : "Low", Brake : "Low") and write error code "01" in EEPROM.

b) Charge error
   Error code: 02
   Error conditions : Charge completion (Charge Switch 1 : "Low", Charge Switch 2 : "Low") has not been detected within 1000 msec after the start of Charge Motor.
   Recovery procedure : Stop the Charge Motor (DRIV : "Low", Brake : "Low") and write error code "02" in EEPROM.

c) B2 error (according to place of occurrence)
   Error codes : 10 to 15
   Error conditions : Battery level has been judged as B2 by battery check.
   Recovery procedure : Turn OFF the Winding Motor, Charge Motor, Shutter First Curtain Magnet and Second Curtain Magnet and write the error code for the place of occurrence in EEPROM.

[Check Procedure for Error Code Display]

1) Turn ON the Main Switch of the camera and open the Back Cover.
2) Press the Manual Rewind Button and press the Shutter Release Button while keeping the Manual Rewind Button pressed to set manual adjusting mode.
3) Set the A.B.C. Lever to "OFF" (Mode I).
4) Set item No. 0A (Error code) by pressing the Drive Button. At this point, the Mode LCD will display an error code in hexadecimal.
5) Complete manual adjusting mode by turning OFF the Main Switch or closing the Back Cover.

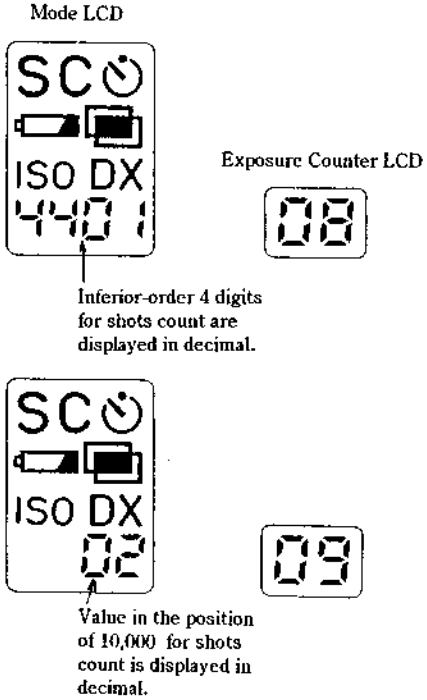


C-5-9. Checking of Shots Counter

* The Shots Counter automatically writes the number of shutter releases.

1) Turn ON the Main Switch of the camera and open the Back Cover.
2) Press the Manual Rewind Button and press the Shutter Release Button while keeping the Manual Rewind Batton pressed to set manual adjusting mode.
3) Set the A.B.C. Lever to "OFF" (Mode I).
4) Set item No. 08 (Shots counter) by pressing the Drive Button. At this point, the Mode LCD will display a shots counter (inferior-order 4 digits) in decimal. Note down the displayed value.
5) Set item No. 09 (Shots counter) by pressing the Drive Button. At this point, the Mode LCD will display a shots counter (position of 10,000) in decimal. Note down the displayed value.

   Shots count = (Data at 09) (Data at 08)



[Example]

Value on Exposure Counter LCD		Value on Mode LCD
08	----------	4401 (Inferior-order 4 digits)
09	----------	02 (Position of 10,000)

If the displayed values are as above, then
Number of Shots = 24401
(Values are expressed in decimal.)

6) Complete manual adjusting mode by turning OFF the Main Switch or closing the Back Cover.

Conversion Table for Decimal Numbers & Hexadecimal Numbers (+)

Decimal	Hexadecimal	Decimal	Hexadecimal	Decimal	Hexadecimal	Decimal	Hexadecimal
0	0	64	40	128	80	192	C0
1	1	65	41	129	81	193	C1
2	2	66	42	130	82	194	C2
3	3	67	43	131	83	195	C3
4	4	68	44	132	84	196	C4
5	5	69	45	133	85	197	C5
6	6	70	46	134	86	198	C6
7	7	71	47	135	87	199	C7
8	8	72	48	136	88	200	C8
9	9	73	49	137	89	201	C9
10	A	74	4A	138	8A	202	CA
11	B	75	4B	139	8B	203	CB
12	C	76	4C	140	8C	204	CC
13	D	77	4D	141	8D	205	CD
14	E	78	4E	142	8E	206	CE
15	F	79	4F	143	8F	207	CF
16	10	80	50	144	90	208	D0
17	11	81	51	145	91	209	D1
18	12	82	52	146	92	210	D2
19	13	83	53	147	93	211	D3
20	14	84	54	148	94	212	D4
21	15	85	55	149	95	213	D5
22	16	86	56	150	96	214	D6
23	17	87	57	151	97	215	D7
24	18	88	58	152	98	216	D8
25	19	89	59	153	99	217	D9
26	1A	90	5A	154	9A	218	DA
27	1B	91	5B	155	9B	219	DB
28	1C	92	5C	156	9C	220	DC
29	1D	93	5D	157	9D	221	DD
30	1E	94	5E	158	9E	222	DE
31	1F	95	5F	159	9F	223	DF
32	20	96	60	160	A0	224	E0
33	21	97	61	161	A1	225	E1
34	22	98	62	162	A2	226	E2
35	23	99	63	163	A3	227	E3
36	24	100	64	164	A4	228	E4
37	25	101	65	165	A5	229	E5
38	26	102	66	166	A6	230	E6
39	27	103	67	167	A7	231	E7
40	28	104	68	168	A8	232	E8
41	29	105	69	169	A9	233	E9
42	2A	106	6A	170	AA	234	EA
43	2B	107	6B	171	AB	235	EB
44	2C	108	6C	172	AC	236	EC
45	2D	109	6D	173	AD	237	ED
46	2E	110	6E	174	AE	238	EE
47	2F	111	6F	175	AF	239	EF
48	30	112	70	176	B0	240	F0
49	31	113	71	177	B1	241	F1
50	32	114	72	178	B2	242	F2
51	33	115	73	179	B3	243	F3
52	34	116	74	180	B4	244	F4
53	35	117	75	181	B5	245	F5
54	36	118	76	182	B6	246	F6
55	37	119	77	183	B7	247	F7
56	38	120	78	184	B8	248	F8
57	39	121	79	185	B9	249	F9
58	3A	122	7A	186	BA	250	FA
59	3B	123	7B	187	BB	251	FB
60	3C	124	7C	188	BC	252	FC
61	3D	125	7D	189	BD	253	FD
62	3E	126	7E	190	BE	254	FE
63	3F	127	7F	191	BF	255	FF

Conversion Table for Decimal Numbers & Hexadecimal Numbers (+/-)

Decimal	Hexadecimal	Decimal	Hexadecimal	Decimal	Hexadecimal	Decimal	Hexadecimal
0	0	64	40	-1	FF	-65	BF
1	1	65	41	-2	FE	-66	BE
2	2	66	42	-3	FD	-67	BD
3	3	67	43	-4	FC	-68	BC
4	4	68	44	-5	FB	-69	BB
5	5	69	45	-6	FA	-70	BA
6	6	70	46	-7	F9	-71	B9
7	7	71	47	-8	F8	-72	B8
8	8	72	48	-9	F7	-73	B7
9	9	73	49	-10	F6	-74	B6
10	A	74	4A	-11	F5	-75	B5
11	B	75	4B	-12	F4	-76	B4
12	C	76	4C	-13	F3	-77	B3
13	D	77	4D	-14	F2	-78	B2
14	E	78	4E	-15	F1	-79	B1
15	F	79	4F	-16	F0	-80	B0
16	10	80	50	-17	EF	-81	AF
17	11	81	51	-18	EE	-82	AE
18	12	82	52	-19	ED	-83	AD
19	13	83	53	-20	EC	-84	AC
20	14	84	54	-21	EB	-85	AB
21	15	85	55	-22	EA	-86	AA
22	16	86	56	-23	E9	-87	A9
23	17	87	57	-24	E8	-88	A8
24	18	88	58	-25	E7	-89	A7
25	19	89	59	-26	E6	-90	A6
26	1A	90	5A	-27	E5	-91	A5
27	1B	91	5B	-28	E4	-92	A4
28	1C	92	5C	-29	E3	-93	A3
29	1D	93	5D	-30	E2	-94	A2
30	1E	94	5E	-31	E1	-95	A1
31	1F	95	5F	-32	E0	-96	A0
32	20	96	60	-33	DF	-97	9F
33	21	97	61	-34	DE	-98	9E
34	22	98	62	-35	DD	-99	9D
35	23	99	63	-36	DC	-100	9C
36	24	100	64	-37	DB	-101	9B
37	25	101	65	-38	DA	-102	9A
38	26	102	66	-39	D9	-103	99
39	27	103	67	-40	D8	-104	98
40	28	104	68	-41	D7	-105	97
41	29	105	69	-42	D6	-106	96
42	2A	106	6A	-43	D5	-107	95
43	2B	107	6B	-44	D4	-108	94
44	2C	108	6C	-45	D3	-109	93
45	2D	109	6D	-46	D2	-110	92
46	2E	110	6E	-47	D1	-111	91
47	2F	111	6F	-48	D0	-112	90
48	30	112	70	-49	CF	-113	8F
49	31	113	71	-50	CE	-114	8E
50	32	114	72	-51	CD	-115	8D
51	33	115	73	-52	CC	-116	8C
52	34	116	74	-53	CB	-117	8B
53	35	117	75	-54	CA	-118	8A
54	36	118	76	-55	C9	-119	89
55	37	119	77	-56	C8	-120	88
56	38	120	78	-57	C7	-121	87
57	39	121	79	-58	C6	-122	86
58	3A	122	7A	-59	C5	-123	85
59	3B	123	7B	-60	C4	-124	84
60	3C	124	7C	-61	C3	-125	83
61	3D	125	7D	-62	C2	-126	82
62	3E	126	7E	-63	C1	-127	81
63	3F	127	7F	-64	C0	-128	80

C-6. OTHERS

C-6-1. Curtain Travel Speed

* The curtain travel speed can not be adjusted. Therefore, replace the Shutter Unit if the travel speed of each curtain is significantly different from the specified value.
* The travel speeds of the first curtain and second curtain are both such that each curtain takes about 5.80 ms to travel the vertical length of 21 mm.

C-6-2. Synchro Contact

① Delay time

Sensing point of Shutter Tester : 21 mm
Measure at shutter time "X".
A range : 0.8 ms or above

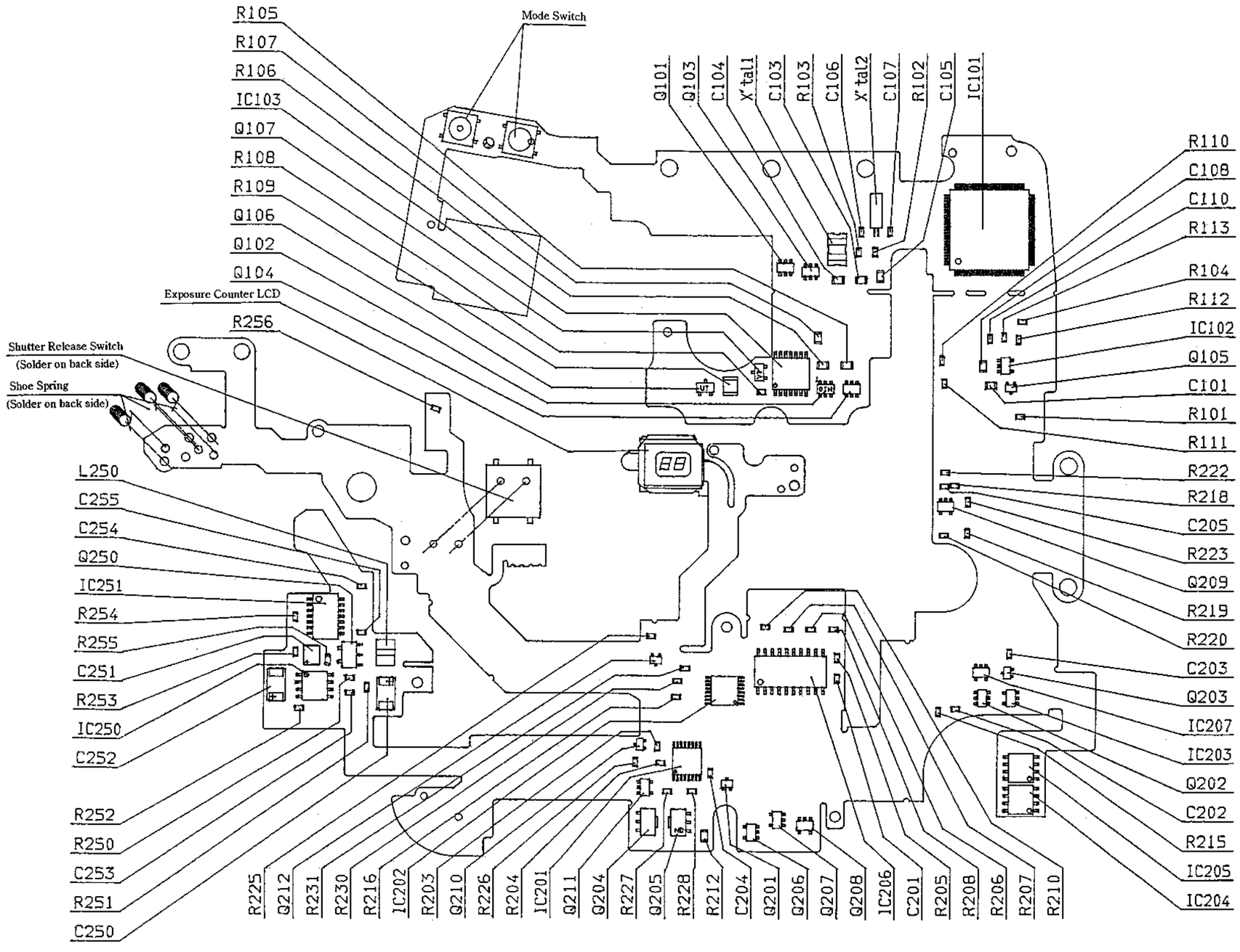
② Contact efficiency

The contact efficiency must be 60% or above at shutter speed of 1/125 sec. (X) or less.
(Use a contact efficiency meter at 1 ms.)

C-6-3. Current Consumption

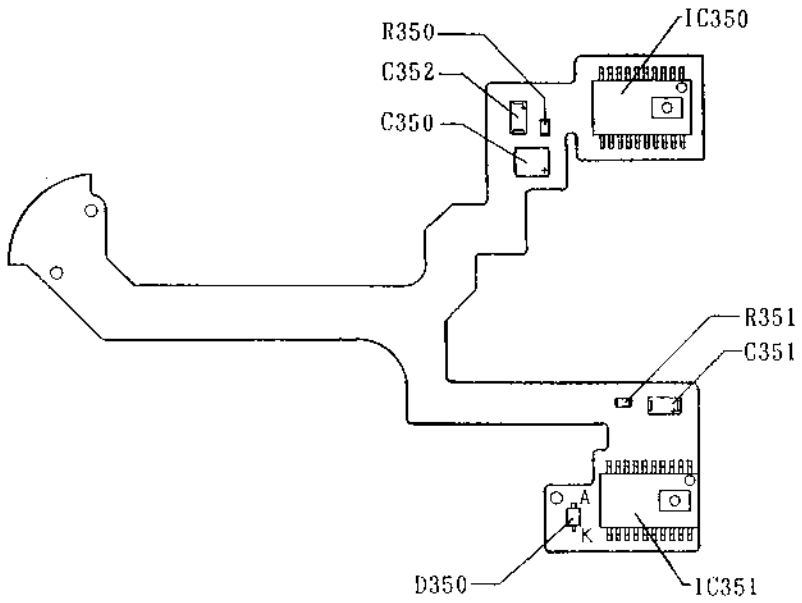
Main Switch OFF (standby current)	20 μA or below
Main Switch ON	
LCD ON (Power ON)	100 mA or below
LCD OFF	20 μA or below
Blank shots advance	400 mA or below
Winding operation	500 mA or below
Winding stop current	1800 mA or below
Rewinding operation	400 mA or below
Release (shutter operation, single)	400 mA or below

ELECTRIC ELEMENTS LOCATING DIAGRAMS

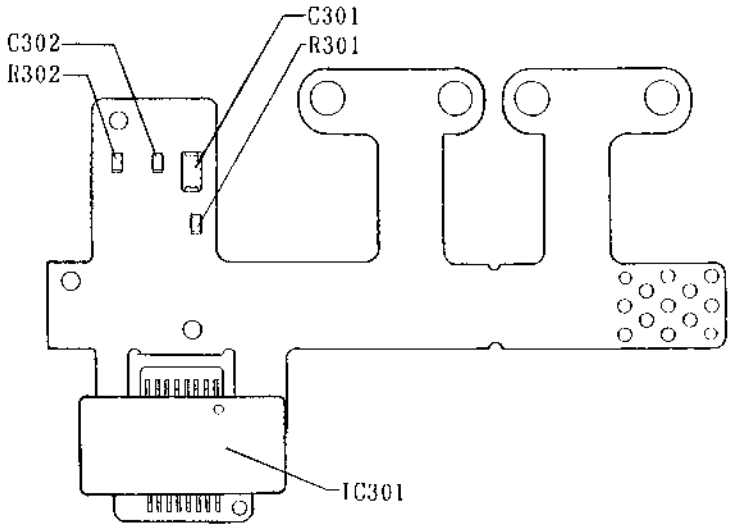


ELECTRIC PARTS ON AE FPC, AF FPC & TTL FLASH AUTO W/L. CONTACT FPC

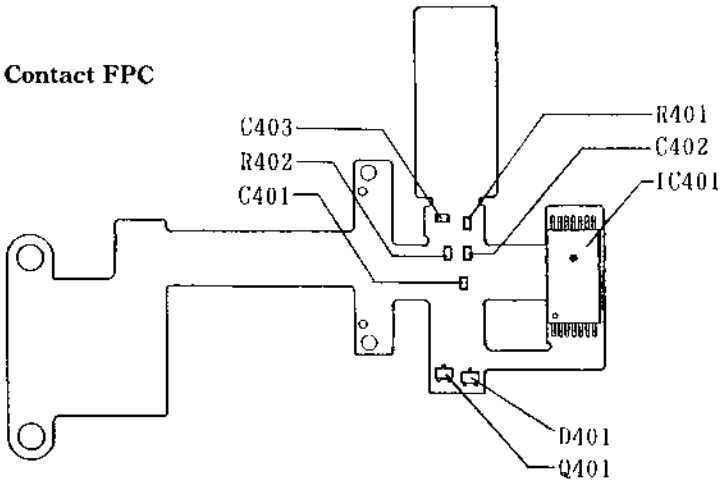
AE FPC



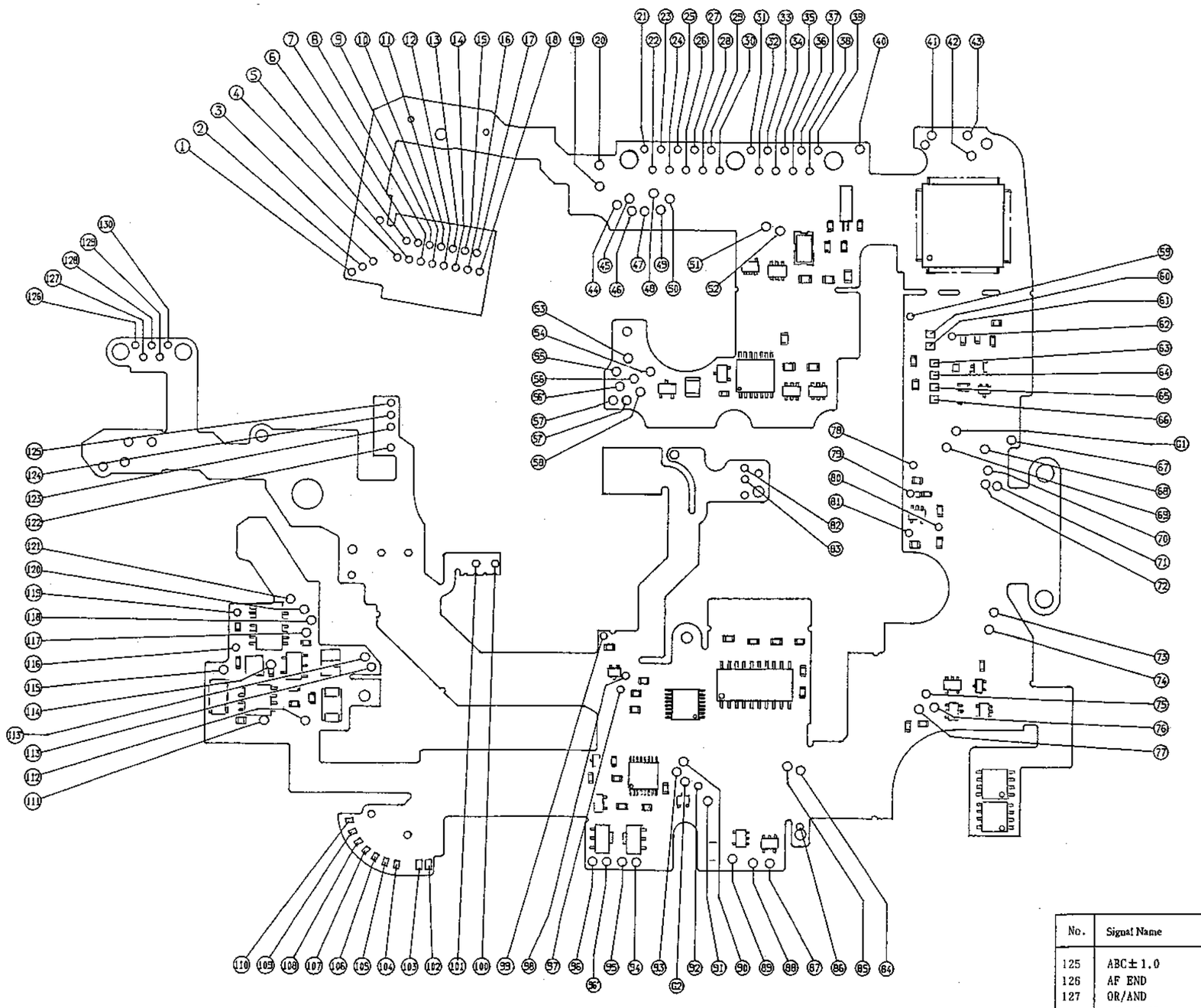
AF FPC



TTL Flash Auto W/L. Contact FPC

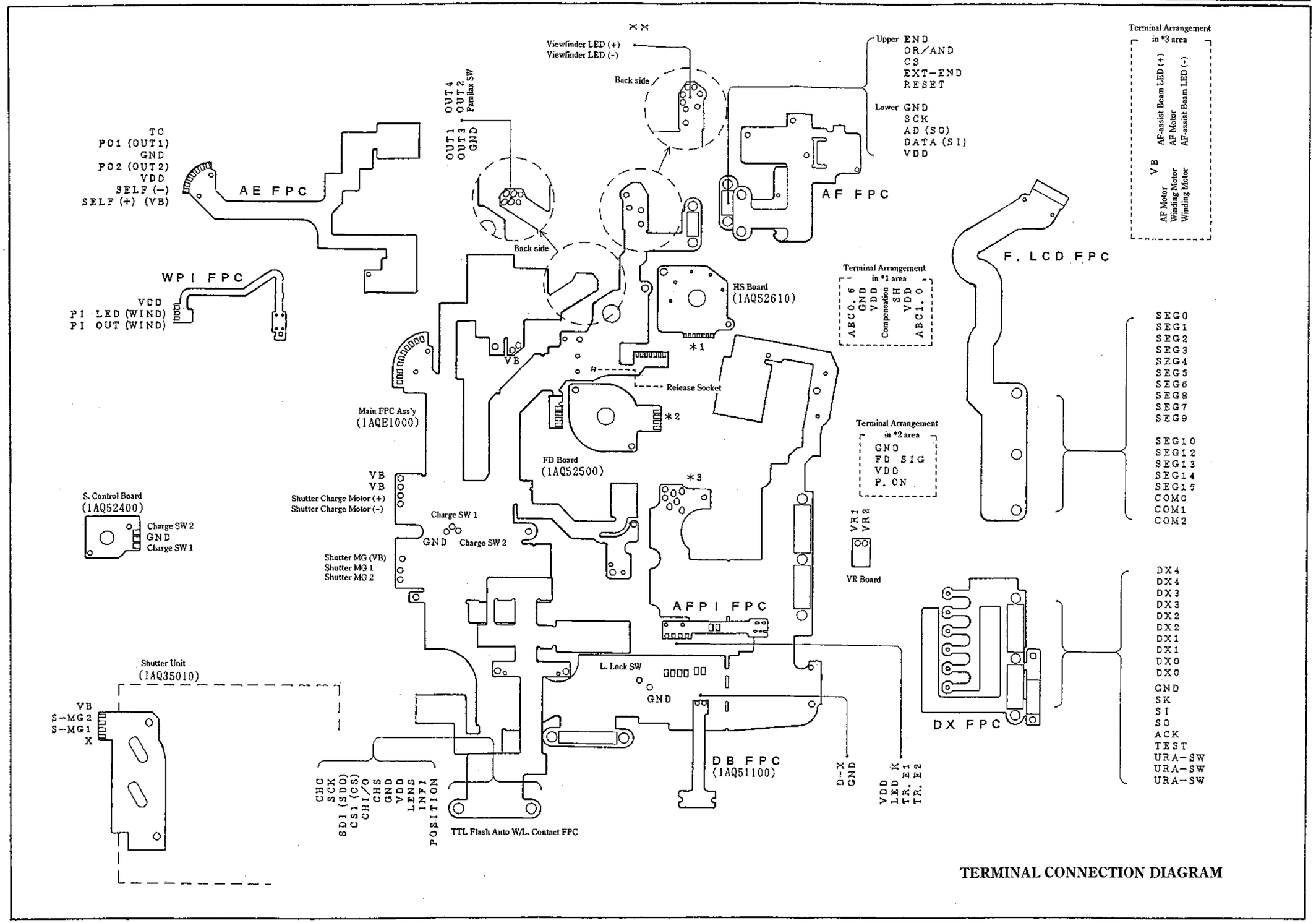


TEST POINTS ON MAIN FPC ASS'Y

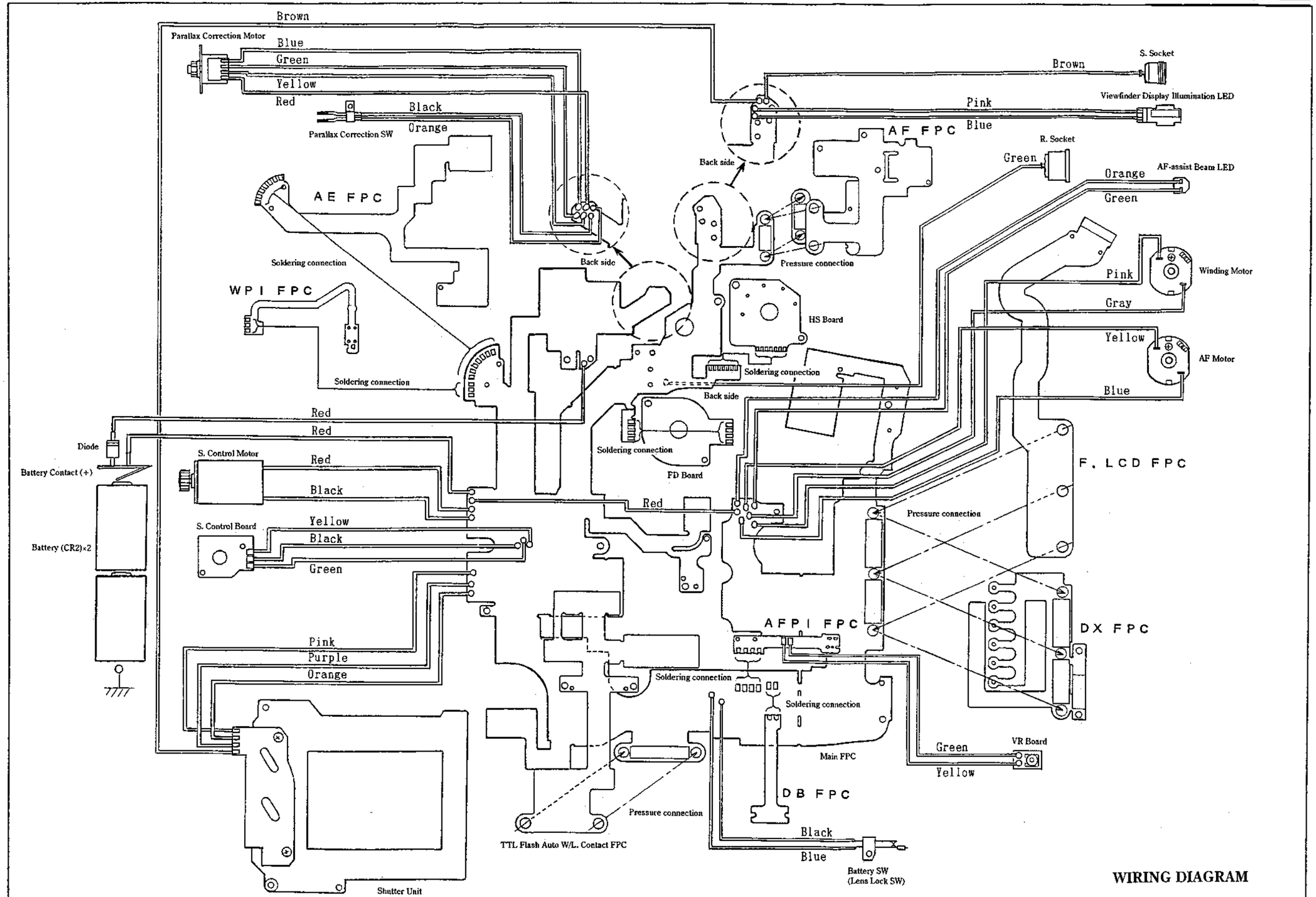


No.	Signal Name	No.	Signal Name
1	COM 2	64	AFPI E1(PULS2)
2	COM 1	65	AFPI LED
3	COM 0	66	VDD
4	SEG27	G1	GND
5	SEG25	67	CHC
6	SEG26	68	CHIC CS
7	SEG24	69	Lens Lock SW
8	SEG23	70	Lens Reference Position SW
9	SEG22	71	Adjusted value for ∞
10	SEG21	72	Lens Model Information
11	SEG20	73	CHS(CH I/O)
12	SEG19	74	CHS
13	SEG18	75	WPI OUT
14	SEG17	76	Light Metering Vref 4V
15	SEG16	77	AD Vref
16	COM 2	78	AF-P2(Tr B)
17	COM 1	79	AF-P1(Tr B)
18	COM 0	80	AF PULSE2
19	DRIVE SW	81	AF PULSE1
20	ISO SW	82	Main SW
21	SEG 0	83	AE Lock SW
22	SEG 1	84	Check SW
23	SEG 2	85	Shutter Release SW
24	SEG 3	86	GND(POWER)
25	SEG 4	87	S-MG 2
26	SEG 5	88	S-MG 1
27	SEG 6	89	VB
28	SEG 8	90	Charge SW 2
29	SEG 7	91	VCC
30	SEG 9	92	B.C.
31	SEG10	G2	GND
32	SEG11	93	Charge SW 1
33	SEG12	94	Charge Motor
34	SEG13	95	Charge Motor (+)
35	SEG14	96	VB
36	SEG15	96'	VB
37	COM 0	97	FLCD LED
38	COM 1	98	AX
39	COM 2	99	CH I/O
40	Back Cover SW	100	P. ON
41	GND (Signal)	101	Focus Dial Information
42	TEST	102	WPI OUT
43	REWIND SW	103	WPI LED
44	DX 4	104	VB
45	DX 3	105	SELF LED
46	DX 2	106	VDD
47	DX 1	107	Light Metering Output 2
48	DX 0	108	GND (Signal)
49	SCK	109	Light Metering Output 1
50	SD 1	110	Light Metering Temp. Output (TO)
51	SD 0	111	VCC
52	ACK	112	GND(VIN)
53	GND(POWER)	113	VB(VIN)
54	Winding Motor	113'	VB(VIN)
55	AF-assist Beam LED	114	VDC/DC
56	AF, Winding Motor	115	Parallax Correction SW
56'	AF, Winding Motor	116	VC (Pulse Motor)
57	VB	117	Pulse Motor OUT4
57'	VB	118	Pulse Motor OUT3
58	AF Motor	119	Vref (Pulse Motor)
59	VL(1.7V)	120	Pulse Motor OUT1
60	GND (Signal)	121	Pulse Motor OUT2
61	Imprinting Signal	122	ABC± 0.5
62	CPU RESET	123	Exp. Compensation Information
63	AFPI E2(PULS1)	124	S. Speed Information

No.	Signal Name
125	ABC± 1.0
126	AF END
127	OR/AND
128	AF-IC CS
129	EXT-END
130	AF RESET



TERMINAL CONNECTION DIAGRAM

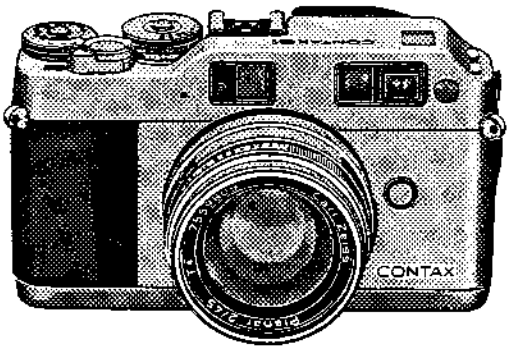


WIRING DIAGRAM

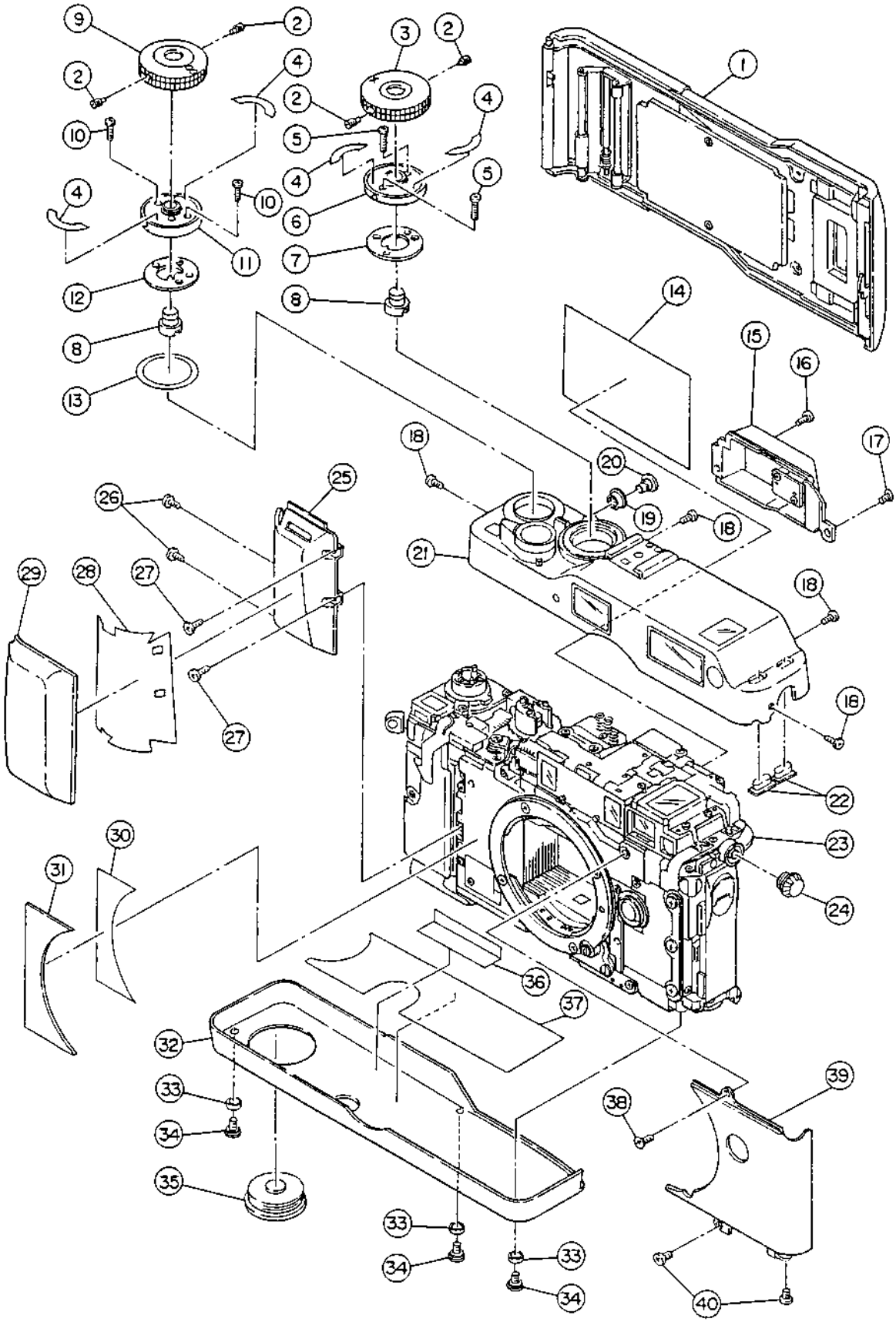
KYOCERA

CONTAX G1

ASSEMBLING CHART



KYOCERA CORPORATION
Optical Equipments Group
Servise Dept 1AQ 941007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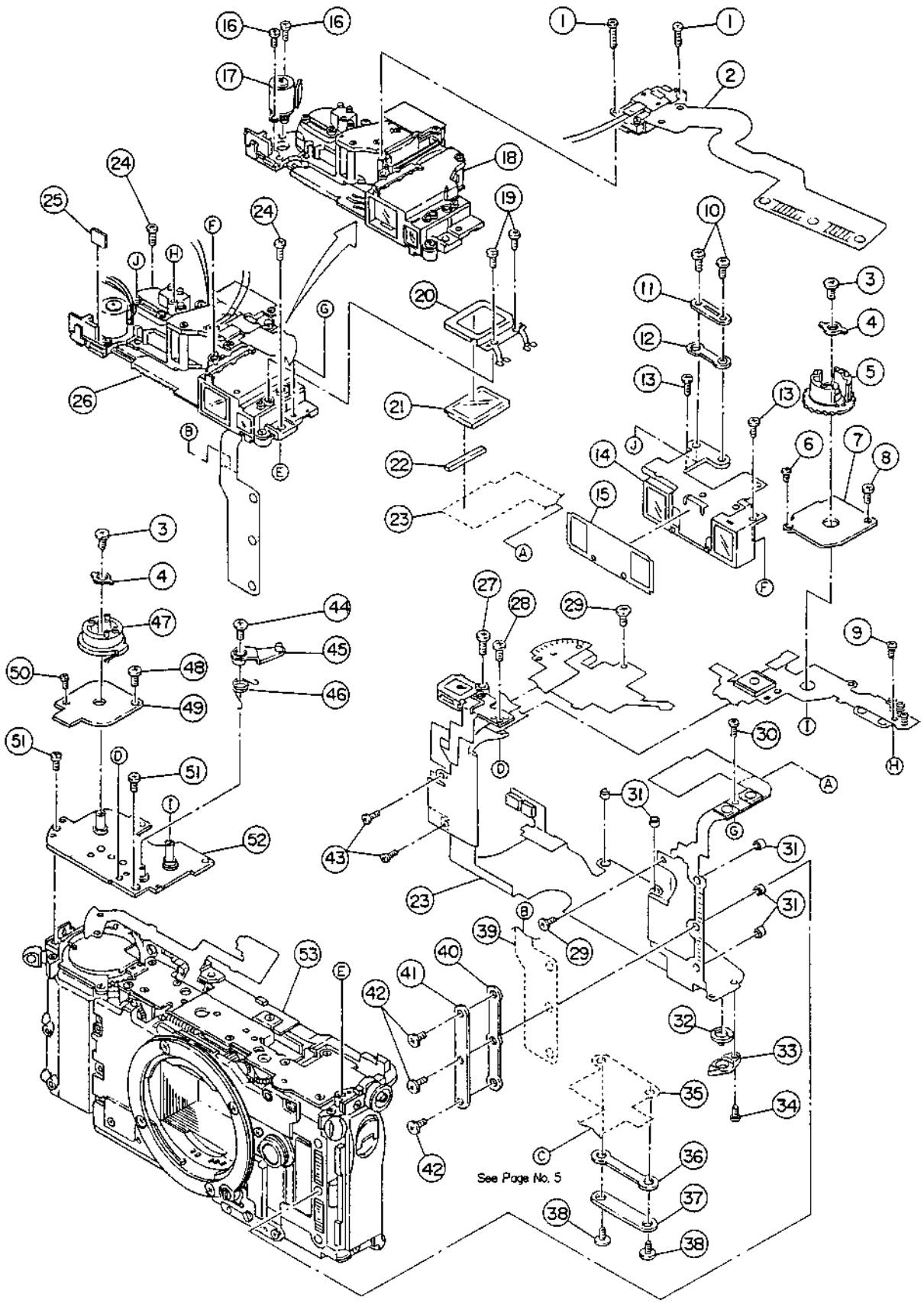
	PARTS No.	DESCRIPTION	QTY
1	1AQA5000	BACK COVER ASS'Y (See Page No.6)	1
2	1AQ22930	DIAL S.S	4
3	1AQ24910	SH DIAL	1
4	1AQ23600	DIAL SHEET	4
5	69205076	SH HOLDER S.S	2
6	1AQ24840	SH HOLDER	1
7	1AQ24220	SH HOLDER PLATE	1
8	1AQB6000	FD LOCK BUTTON ASS'Y	2
9	1AQ22810	FOCUS DIAL	1
10	69204076	FD HOLDER (1) S.S	2
11	1AQ22740	FD HOLDER (1)	1
12	1AQ22610	FD HOLDER PLATE	1
13	1AQ29500	FD WASHER 05 (t:0.05)	1
	1AQ29600	FD WASHER 07 (t:0.07)	1
	1AQ29700	FD WASHER 10 (t:0.1)	1
	1AQ29800	FD WASHER 20 (t:0.2)	1
14	1AQ10500	PRESSURE PLATE SHEET	1
15	1AQB4000	EYE-PIECE COVER ASS'Y	1
16	63912526	EYE-PIECE COVER ASS'Y S.S	1
17	63813526	EYE-PIECE COVER ASS'Y S.S	1
18	66001191	TOP COVER ASS'Y S.S	4
19	13916400	R. SOCKET DECORATING RING	1
20	13916500	RELEASE CAP (S)	1
21	1AQA4000	TOP COVER ASS'Y (See Page No.6)	1
22	1AQ21220	MODE BUTTON	2
23	*	BODY	1
24	13913800	SYNCHRO CAP	1
25	1AQ28610	GRIP BASE	1
26	61912526	GRIP BASE S.S	2
27	61913526	GRIP BASE S.S	2
28	1AQ29100	GRIP TAPE	1
29	1AQ28710	GRIP COVER	1
30	1AQ29000	FRONT PLATE (LEFT) TAPE	1
31	1AQ28810	FRONT PLATE (LEFT)	1
32	1AQ28020	BOTTOM COVER	1
33	3AQ36210	BOTTOM COVER PACKING	3
34	66001192	BOTTOM COVER S.S	3
35	1AQ11500	BATTERY CAP	1
36	*	INSULATION TAPE	1
37	1AQ10810	INSULATOR (1)	1
38	61812526	FRONT PLATE (RIGHT) S.S	1
39	1AQ28420	FRONT PLATE (RIGHT)	1
40	61912226	FRONT PLATE (RIGHT) S.S	2

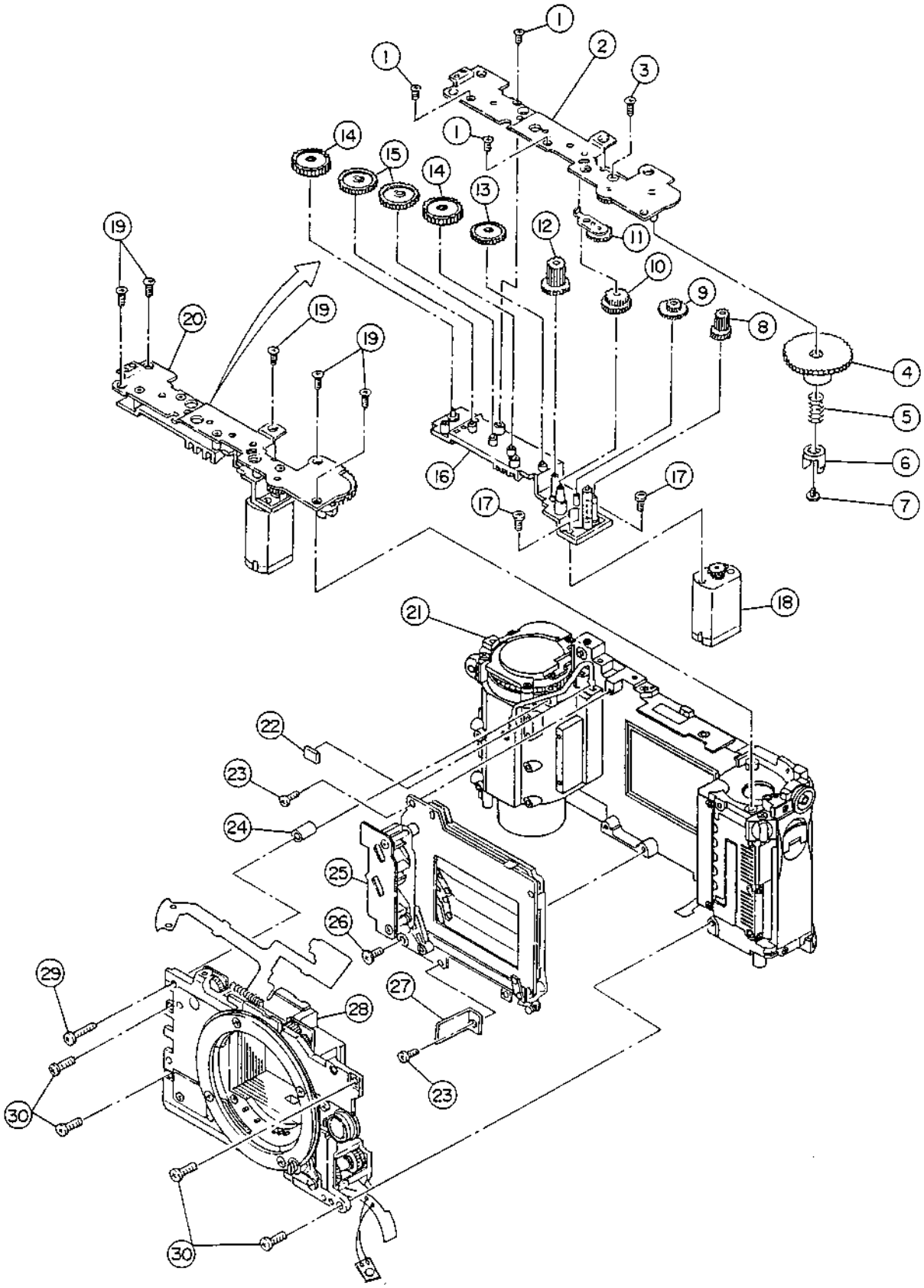
The parts names with * mark are not supplied as a repair part.


See Page No. 5

	PARTS No.	DESCRIPTION	QTY
1	69105076	FINDER COVER (2) ASS'Y S.S	2
2	1AQF9000	FINDER COVER (2) ASS'Y	1
3	66001042	FD LOCK PLATE S.S	2
4	1AQ22230	FD LOCK PLATE	2
5	1AQB8000	SH CONTACT BASE ASS'Y	1
6	63901826	SH BOARD S.S	1
7	1AQ52610	SH BOARD	1
8	62913026	SH BOARD S.S	1
9	69102576	MAIN FPC ASS'Y S.S	1
10	69213576	PRESS CONTACT PLATE S.S	2
11	3BK16300	PRESS CONTACT PLATE	1
12	3BK16210	PRESS CONTACT RUBBER	1
13	69113076	AF MODULE ASS'Y S.S	2
14	*	AF MODULE	1
15	1AQ89000	AF M. MASK (1)	1
16	69203076	PARALLAX CORRECTION MOTOR ASS'Y S.S	2
17	1AQE1200	PARALLAX CORRECTION MOTOR ASS'Y	1
18	*	FINDER UNIT	1
19	69113076	MODE LCD RETAINER S.S	2
20	1AQ21100	MODE LCD RETAINER	1
21	1AQ52200	MODE LCD	1
22	1AQ51900	MODE LCD CONNECTOR	1
23	1AQE1000	MAIN FPC ASS'Y	1
24	63913026	FINDER UNIT ASS'Y S.S	2
25	1AQ87800	EXTERNAL LIGHT METERING FILTER	1
26	1AQF1000	FINDER UNIT ASS'Y	1
27	61915026	MAIN FPC ASS'Y S.S	1
28	61914026	MAIN FPC ASS'Y S.S	1
29	66001049	MAIN FPC ASS'Y S.S	2
30	69113076	MAIN FPC ASS'Y S.S	1
31	1AQ14500	FPC CONNECT POST	5
32	3AQ65100	RW BUTTON	1
33	1AQ28200	RW BUTTON HOLDER	1
34	61913026	RW BUTTON HOLDER S.S	1
35	*	TTL FLASH AUTO W/L. CONTACT FPC (See Page No.5)	1
36	1AM12510	FPC CONNECT RUBBER	1
37	1AM12220	FPC CONNECT PLATE	1
38	66001025	FPC CONNECT PLATE S.S	2
39	*	F. LCD FPC	1
40	1AQ14200	FPC CONNECT RUBBER	1
41	1AQ14000	FPC CONNECT PLATE	1
42	66001025	FPC CONNECT PLATE S.S	3
43	61912222	MAIN FPC ASS'Y S.S	2
44	66001042	SH CLICK LEVER ASS'Y S.S	1
45	1AQB0200	SH CLICK LEVER ASS'Y	1
46	1AQ24110	SH CLICK LEVER SPRING	1
47	1AQB5000	FD CONTACT BASE ASS'Y	1
48	62913026	FD BOARD S.S	1
49	1AQ52500	FD BOARD	1
50	63901826	FD BOARD S.S	1
51	61913026	DIAL BASE PLATE S.S	2
52	*	DIAL BASE PLATE	1
53	*	BODY	1

14,15,	1AQE7000	AF MODULE ASS'Y	1
44～46,52	1AQC2100	DIAL BASE PLATE ASS'Y	1

The parts names with * mark are not supplied as a repair part.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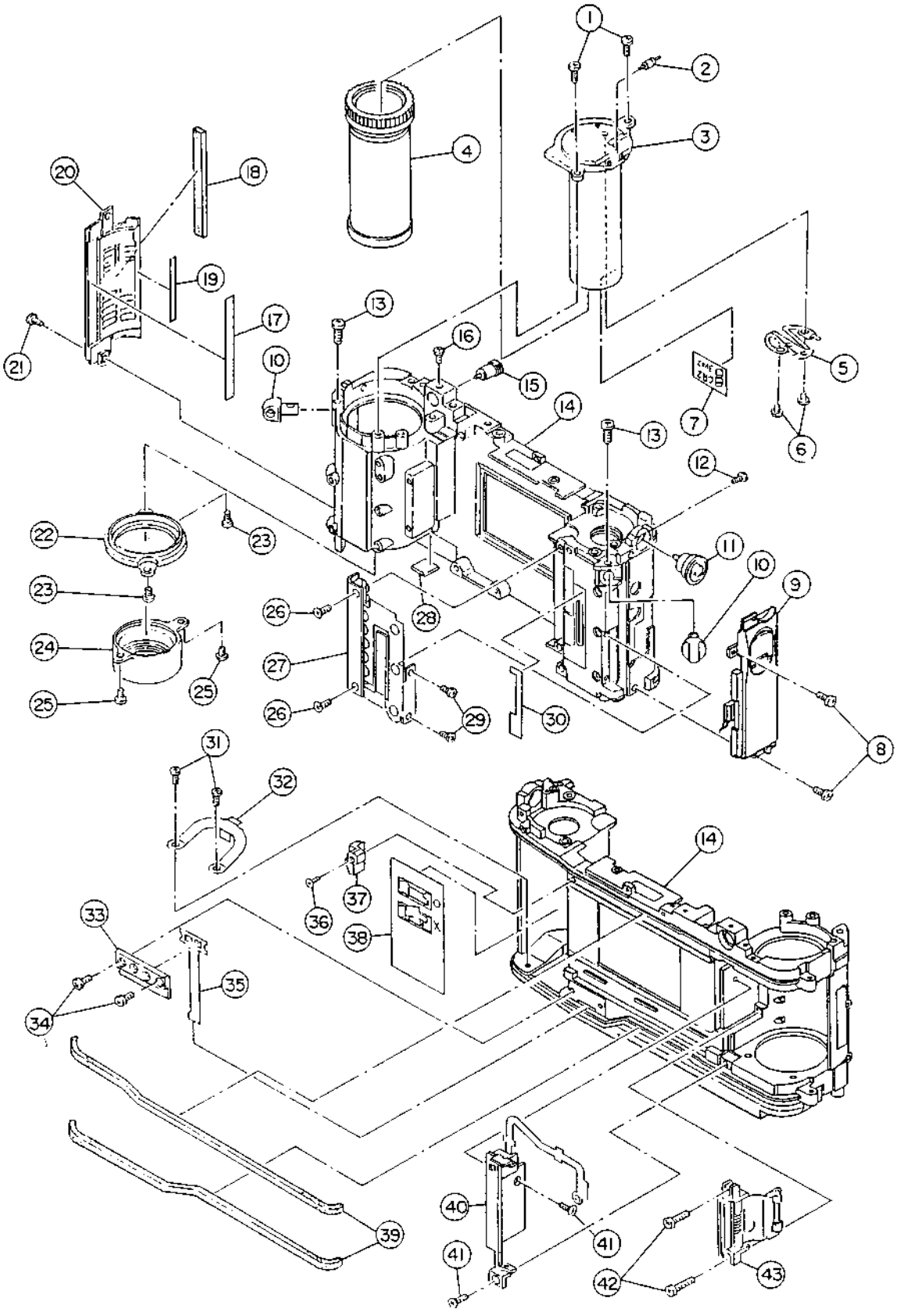
	PARTS No.	DESCRIPTION	QTY
1	69303076	WINDING BASE PLATE (1) S.S	3
2	*	WINDING BASE PLATE (1)	1
3	69313076	WINDING BASE PLATE (1) S.S	1
4	1AQC3800	R. FORK CASE ASS'Y	1
5	16868710	RW CLAW SPRING	1
6	1AA44010	R. FORK	1
7	66001042	R. FORK S.S	1
8	1AQ30310	WINDING GEAR (1)	1
9	1AQ30410	WINDING GEAR (2)	1
10	1AQ32000	REWINDING GEAR (1)	1
11	1AQC3600	EPICYCLIC GEAR ASS'Y	1
12	1AQ30510	WINDING GEAR (3)	1
13	1AQ30600	WINDING GEAR (4)	1
14	1AQ30700	WINDING GEAR (5)	2
15	1AQ30800	WINDING GEAR (6)	2
16	1AQ30210	WINDING BASE PLATE (2)	1
17	63902526	WINDING MOTOR ASS'Y S.S	2
18	1AQC5300	WINDING MOTOR ASS'Y	1
19	61812526	WINDING UNIT ASS'Y S.S	5
20	1AQC4000	WINDING UNIT ASS'Y	1
21	*	BODY	1
22	1AQ31400	WPI MOQUETTE	1
23	61914026	SHUTTER UNIT S.S	2
24	1AQ68100	MOUNT BASE SUPPORT SLEEVE	1
25	1AQ35010	SHUTTER UNIT	1
26	66001049	SHUTTER UNIT S.S	1
27	1AQ68000	MOUNT BASE SUPPORT PLATE	1
28	1AQM1000	MOUNT BASE ASS'Y (See Page No.5)	1
29	61919526	MOUNT BASE ASS'Y S.S	1
30	61923526	MOUNT BASE ASS'Y S.S	4

The parts names with * mark are not supplied as a repair part.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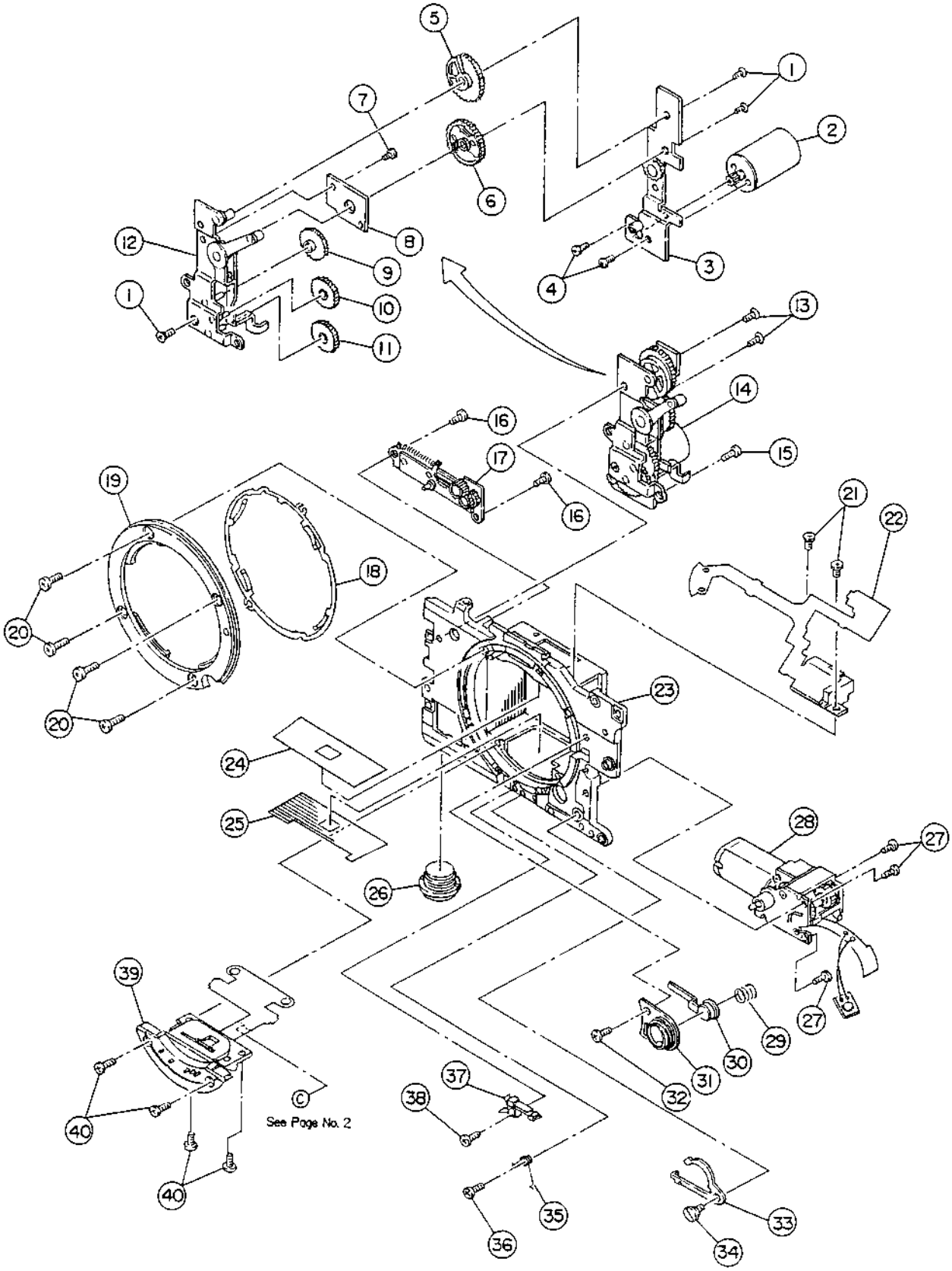
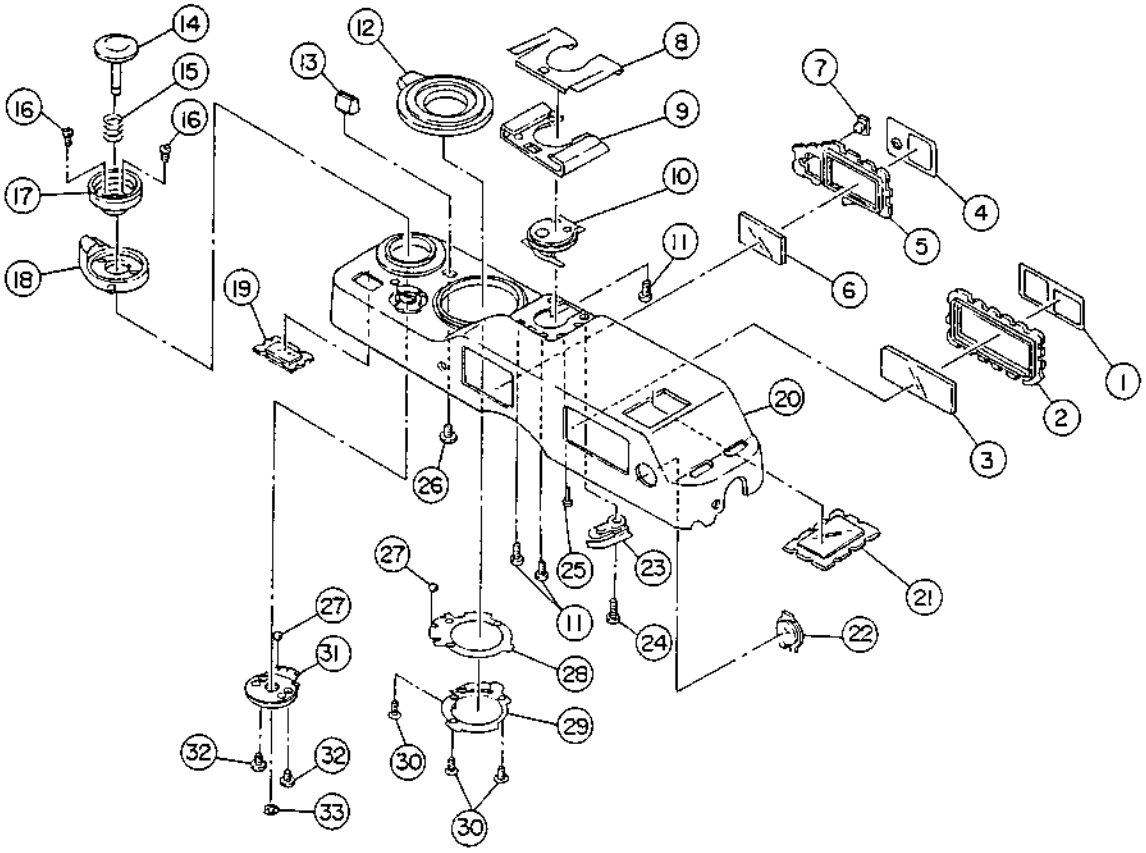
	PARTS No.	DESCRIPTION	QTY
1	61913526	BATTERY BOX S.S	2
2	5EDDSM1XN04**01	DIODE	1
3	1AQ11410	BATTERY BOX	1
4	1AQ31210	SPOOL	1
5	1AQ11620	BATTERY CONTACT (+)	1
6	69112066	BATTERY CONTACT (+) S.S	2
7	1AQ11900	BATTERY SEAL	1
8	63913026	BACK COVER LOCK ASS'Y S.S	2
9	1AQB9000	BACK COVER LOCK ASS'Y	1
10	1AQ16310	STRAP HOLDER	2
11	1AQA3600	SYNCHRO SOCKET ASS'Y	1
12	66001188	SYNCHRO SOCKET ASS'Y S.S	1
13	61925026	STRAP HOLDER S.S	2
14	*	BODY	1
15	1AQA3500	RELEASE SOCKET ASS'Y	1
16	66001188	RELEASE SOCKET ASS'Y S.S	1
17	1AQ15400	BODY AUXILIARY PLATE TAPE	1
18	1AQ15700	BODY AUXILIARY PLATE MOQUETTE	1
19	3AQ14110	FILM MARK	1
20	1AQ15320	BODY AUXILIARY PLATE (LEFT)	1
21	61912026	BODY AUXILIARY PLATE S.S	1
22	1AQ31300	SPOOL HOLDER	1
23	61913026	SPOOL HOLDER S.S	2
24	1AQA3200	BATTERY CAP HOLDER ASS'Y	1
25	61913022	BATTERY CAP HOLDER ASS'Y S.S	2
26	61813026	DX ASS'Y S.S	2
27	1AQA3300	DX ASS'Y	1
28	1AQ31400	WPI MOQUETTE	1
29	61913022	DX FPC S.S	2
30	1AQ13200	TEST TERMINAL TAPE	1
31	61912029	CARTRIDGE LIFTER S.S	2
32	1AQ13600	CARTRIDGE LIFTER	1
33	1AQ13820	CONTACT COVER	1
34	61913029	CONTACT COVER S.S	2
35	1AQ51100	D.B FPC	1
36	61915029	CARTRIDGE GUIDE S.S	1
37	1AQ13700	CARTRIDGE GUIDE	1
38	1AQ10600	EXPLANATION SEAL	1
39	1AQ19110	BODY MOQUETTE	2
40	1AQE9000	WPI FPC ASS'Y	1
41	61813029	WPI FPC ASS'Y S.S	2
42	61915026	F. ROLLER (3) LEVER ASS'Y S.S	2
43	1AQA3100	F. ROLLER (3) LEVER ASS'Y	1

The parts names with * mark are not supplied as a repair part.


See Page No. 2

	PARTS No.	DESCRIPTION	QTY
1	61812526	S. SET BASE PLATE (2) S.S	3
2	1AQ54200	S. CONTROL MOTOR	1
3	*	S. SET BASE PLATE (2)	1
4	61912526	S. CONTROL MOTOR S.S	2
5	1AQ37100	S. CAM GEAR	1
6	1AQC3200	S. GEAR (5) ASS'Y	1
7	61901422	S. CONTROL BOARD S.S	1
8	1AQ52400	S. CONTROL BOARD	1
9	1AQ36810	S. GEAR (3)	1
10	1AQ36710	S. GEAR (2)	1
11	1AQ36600	S. GEAR (1)	1
12	*	S. SET BASE PLATE (1)	1
13	61812526	S. CHARGE ASS'Y S.S	2
14	1AQC3500	S. CHARGE ASS'Y	1
15	63913026	S. CHARGE ASS'Y S.S	1
16	61912526	FL BASE PLATE ASS'Y S.S	2
17	1AQC6400	FL BASE PLATE ASS'Y	1
18	1AQ60300	MOUNT SPRING	1
19	1AQ60220	BODY MOUNT	1
20	61924522	BODY MOUNT S.S	4
21	61911526	LIGHT METERING ASS'Y S.S	2
22	1AQE5000	LIGHT METARING ASS'Y	1
23	*	MOUNT BASE	1
24	1AQ67520	MB LIGHT SHIELD PLATE (1)	1
25	1AQ67600	MB LIGHT SHIELD PLATE (2)	1
26	17412600	TRIPOD SCREW	1
27	61912529	AF DRIVE ASS'Y S.S	3
28	1AQM2000	AF DRIVE ASS'Y	1
29	1AQ63610	L. LOCK SPRING	1
30	1AQC6100	L. LOCK BUTTON ASS'Y	1
31	1AQC6200	L. LOCK DECORATING RING ASS'Y	1
32	63913026	L. LOCK DECORATING RING ASS'Y S.S	1
33	1AQ63800	L. CONVERTIBLE SW LEVER	1
34	66001189	L. CONVERTIBLE SW LEVER S.S	1
35	1AQ63920	L. CONVERTIBLE SW SPRING	1
36	66001190	L. CONVERTIBLE SW SPRING S.S	1
37	1AD12300	BATTERY SWITCH	1
38	61913026	BATTERY SWITCH S.S	1
39	1AQE3000	TTL FLASH AUTO W/L. CONTACT ASS'Y	1
40	61912529	TTL FLASH AUTO W/L. CONTACT ASS'Y S.S	4

The parts names with * mark are not supplied as a repair part.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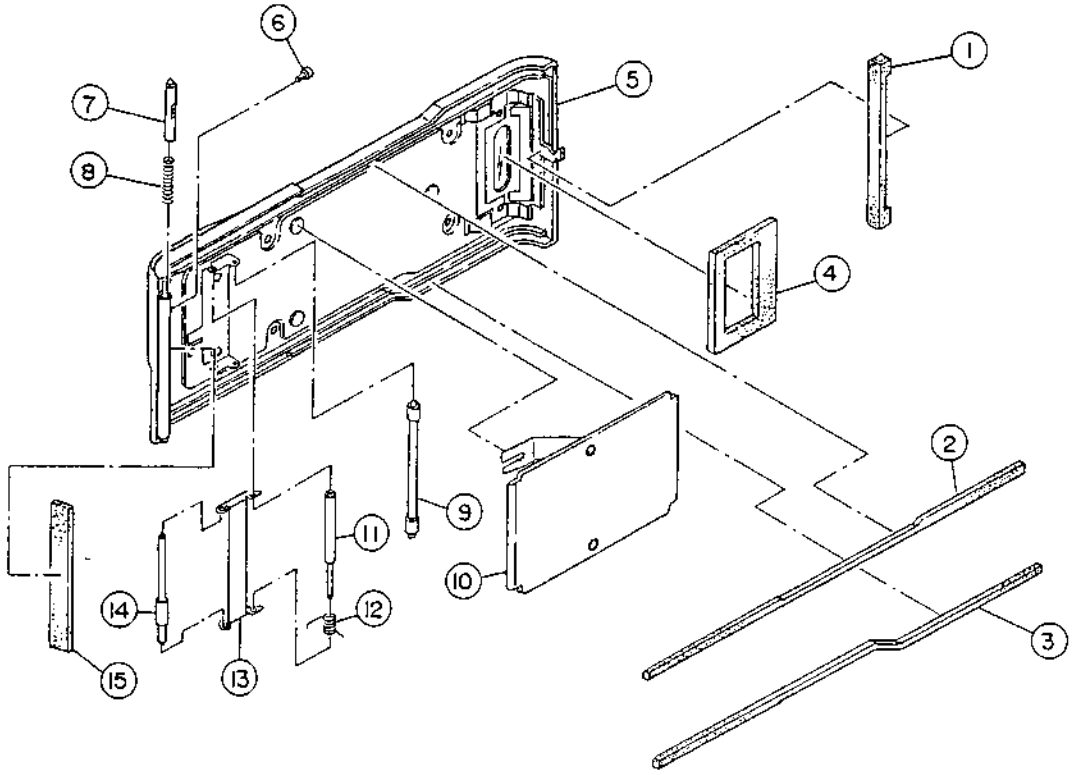
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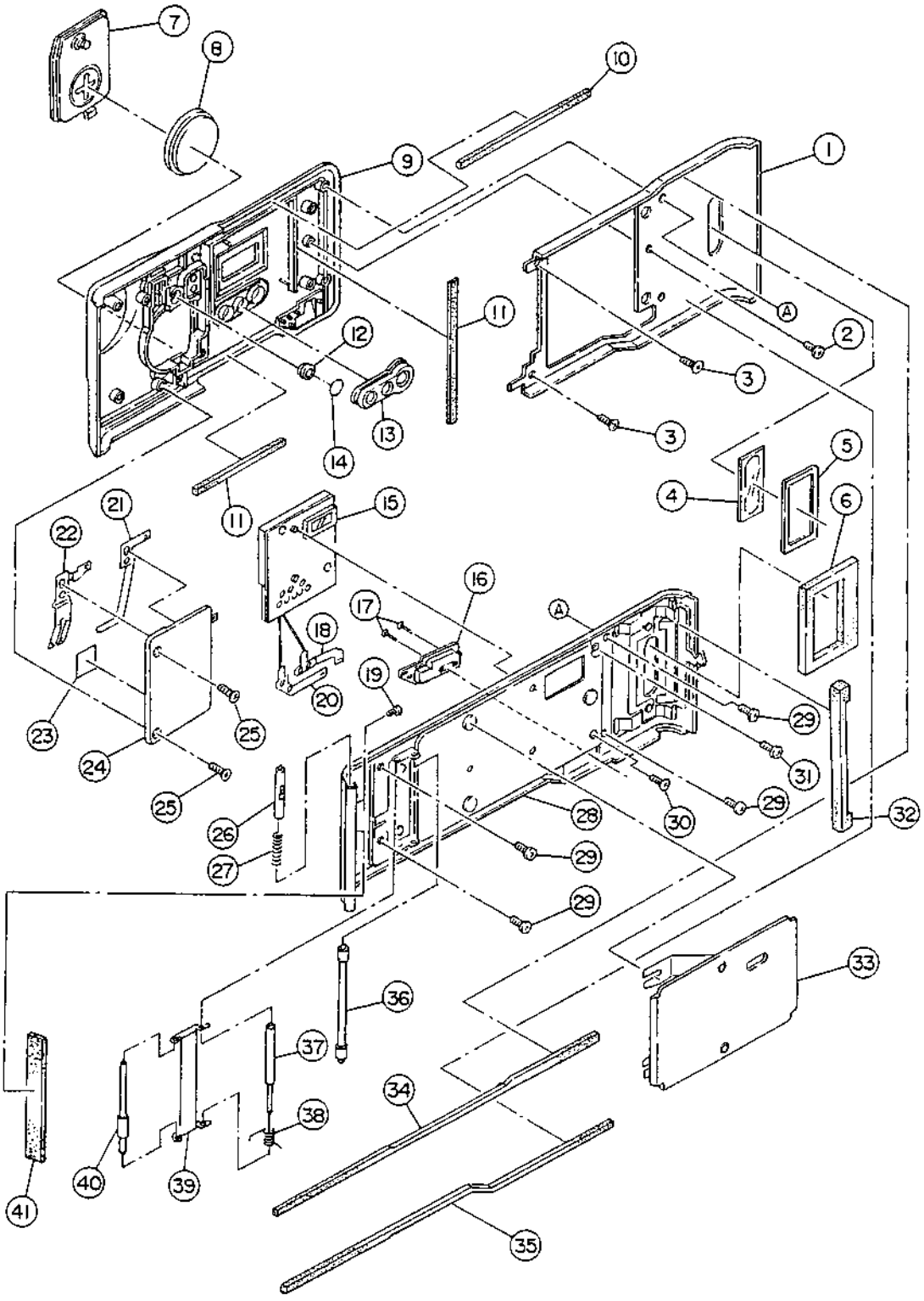
	PARTS No.	DESCRIPTION	QTY
1	1AQ20600	F. MASK	1
2	1AQ20200	F. WINDOW FRAME	1
3	1AQ20300	F. WINDOW	1
4	1AQ20800	AF MASK	1
5	1AQ20400	AF WINDOW FRAME	1
6	1AQ20500	AF WINDOW	1
7	1AQ21000	ST-LED WINDOW	1
8	1AM20320	SHOE PLATE SPRING	1
9	1AQ27320	ACCESSORY SHOE	1
10	1AQA4400	SHOE CONTACT ASS'Y	1
11	61912022	ACCESSORY SHOE S.S	3
12	1AQ24310	ABC RING	1
13	1AQ25010	DIAL INDEX	1
14	1AQ26310	SHUTTER RELEASE BUTTON	1
15	1AQ26410	SHUTTER RELEASE SPRING	1
16	61902526	SHUTTER RELEASE HOLDER S.S	2
17	1AQ25320	SHUTTER RELEASE HOLDER	1
18	1AQ25400	MAIN SW LEVER	1
19	3BK32210	COUNTER WINDOW	1
20	*	TOP COVER	1
21	1AQ20900	LCD WINDOW	1
22	1AQ20700	AF-ASSIST BEAM EMITTER WINDOW	1
23	1AQ27400	SHOE CONTACT PLATE (1) ASS'Y	1
24	61913026	SHOE CONTACT PLATE (1) ASS'Y S.S	1
25	1AM22300	SHOE SW PIN	1
26	66001185	DIAL INDEX S.S	1
27	66701220	STEEL BALL (ϕ 1.2)	2
28	1AQ24510	ABC CLICK PLATE	1
29	1AQA4500	ABC HOLDER PLATE ASS'Y	1
30	69303076	ABC HOLDER PLATE ASS'Y S.S	3
31	1AQA4200	M. SW CLICK HOLDER PLATE ASS'Y	1
32	62902526	M. SW CLICK HOLDER PLATE ASS'Y S.S	2
33	66101225	E RING (E-12)	1

1	1AQ17210	LOCK CLAW MOQUETTE	1
2	1AQ17630	BACK COVER MOQUETTE (2)	1
3	1AQ17730	BACK COVER MOQUETTE (3)	1
4	1AQ17300	FILM CHECK WINDOW MOQUETTE	1
5	*	BACK COVER	1
6	66001166	HINGE SHAFT RELEASE PIN	1
7	3AQ16500	HINGE SHAFT (1)	1
8	17417700	HINGE SHAFT SPRING	1
9	1AA16300	BACK COVER ROLLER (1)	1
10	1AQA5200	PRESSURE PLATE ASS'Y	1
11	1AQ19700	BACK COVER FILM PRESSURE SHAFT	1
12	1AQ19610	ROLLER (2) SPRING	1
13	1AQ19500	ROLLER (2) LEVER	1
14	1AA16810	BACK COVER FILM PRESSURE ROLLER	1
15	1AQ19000	HINGE MOQUETTE	1

The parts names with * mark are not supplied as a repair part.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	PARTS No.	DESCRIPTION	QTY
1	2DB10100	BACK COVER (D)	1
2	69112586	BACK COVER (D) S.S	1
3	69312576	BACK COVER (D) S.S	2
4	1AQ18300	FILM CHECK WINDOW	1
5	1AQ17500	BACK COVER MOQUETTE (1)	1
6	1AQ17300	FILM CHECK WINDOW MOQUETTE	1
7	2DBA6000	D. BATTERY CAP ASS'Y	1
8	*	LITHIUM BATTERY (CR2025)	1
9	2DB10310	BACK COVER GRIP (D)	1
10	2DB11600	D. MOQUETTE (1)	1
11	2DB11700	D. MOQUETTE (2)	2
12	2DB11200	BATTERY CAP SCREW SOCKET	1
13	38415400	MODE BUTTON	1
14	2DB11400	D. RUBBER (1)	1
15	1AA55000	AUTO DATE MODULE	1
16	2DB11010	D. CONTACT COVER	1
17	3AQ40900	D. CONTACT	2
18	2DB10600	D. CONTACT (2)	1
19	66001166	HINGE SHAFT RELEASE PIN	1
20	2DB10500	D. CONTACT (1)	1
21	2DB10800	D. BATTERY CONTACT (+)	1
22	2DB10900	D. BATTERY CONTACT (-)	1
23	3AQ41600	D. BATTERY SEAL	1
24	2DB11100	BATTERY HOLDER	1
25	69313076	BATTERY HOLDER S.S	2
26	3AQ16500	HINGE SHAFT (1)	1
27	17417700	HINGE SHAFT SPRING	1
28	*	BACK COVER SUB-PLATE (D)	1
29	69112586	BACK COVER SUB-PLATE (D) S.S	4
30	69313076	BACK COVER SUB-PLATE (D) S.S	1
31	66001099	BACK COVER SUB-PLATE (D) S.S	1
32	1AQ17210	LOCK CLAW MOQUETTE	1
33	2DBA4000	PRESSURE PLATE (D) ASS'Y	1
34	1AQ17630	BACK COVER MOQUETTE (2)	1
35	1AQ17730	BACK COVER MOQUETTE (3)	1
36	1AA16300	BACK COVER ROLLER (1)	1
37	1AQ19700	BACK COVER FILM PRESSURE SHAFT	1
38	1AQ19610	ROLLER (2) SPRING	1
39	1AQ19500	ROLLER (2) LEVER	1
40	1AA16810	BACK COVER FILM PRESSURE ROLLER	1
41	1AQ19000	HINGE MOQUETTE	1

The parts names with * mark are not supplied as a repair part.